TECHNOLOGY DEPT.

Gas Journal

VOL. 290. 109th YEAR. LONDON, JUNE 5, 1957. No. 4899 PRICE 1/6

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on the up and up

10,000,000 people
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ASCOT

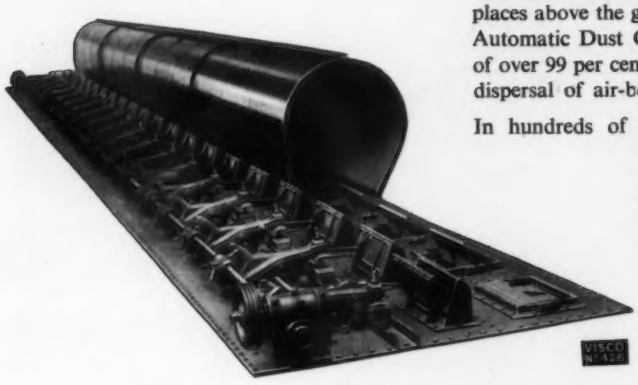
Ascot Gas Water Heaters Ltd.
255 N. Circular Road, London, N.W.10

a member of the Parnall Group of Companies

WHG/A288

VISCO
Dust Collection

Top plate of 20-compartment "Visco-Beth" Automatic Dust Collector showing shaker gear, dampers and part of suction head.



Wherever dust is produced in quantities, as at coal screens, tip wagon stations at collieries, ash pits at gas works, and other places above the ground, there is a real need for "Visco-Beth" Automatic Dust Collectors. These have a recovery efficiency of over 99 per cent. and, wherever installed, have prevented the dispersal of air-borne dust.

In hundreds of industrial plants producing coal, pulverised fuel, lime, cement, chemicals and other materials in powder form, "Visco" Dust Collectors have solved the Dust Problem. They can do the same at your works.

Ask for brochure "Modern Dust Collection and Fume Removal." List No. 532.

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- CORROSION RESISTING STEEL DOOR.
- SPECIAL RESILIENT NON-METALLIC COMPOSITION SEATS SELF-LUBRICATED.
- SIMPLE AND ROBUST IN CONSTRUCTION.
- POSITIVE IN OPERATION.
- NO WEDGES OR SPRINGS.
- CANNOT JAM — OPEN OR CLOSED.
- SPINDLE CAN BE RE-PACKED IN THE OPEN OR CLOSED POSITION.
- STANDARD TEST PRESSURE 100 LBS. PER SQ. IN. AIR.
- INTERNAL OR EXTERNAL SCREW WITH OR WITHOUT INDICATOR.

SIZES 3" TO 24"
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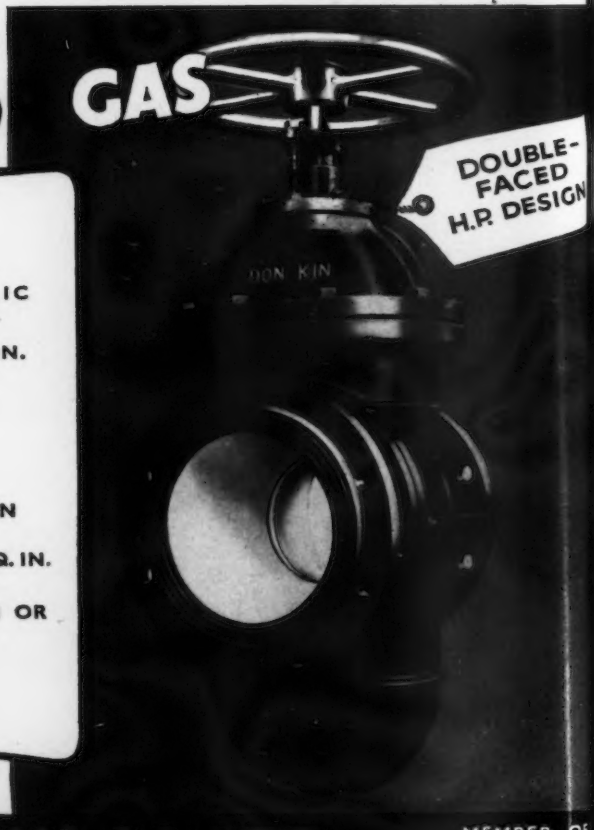
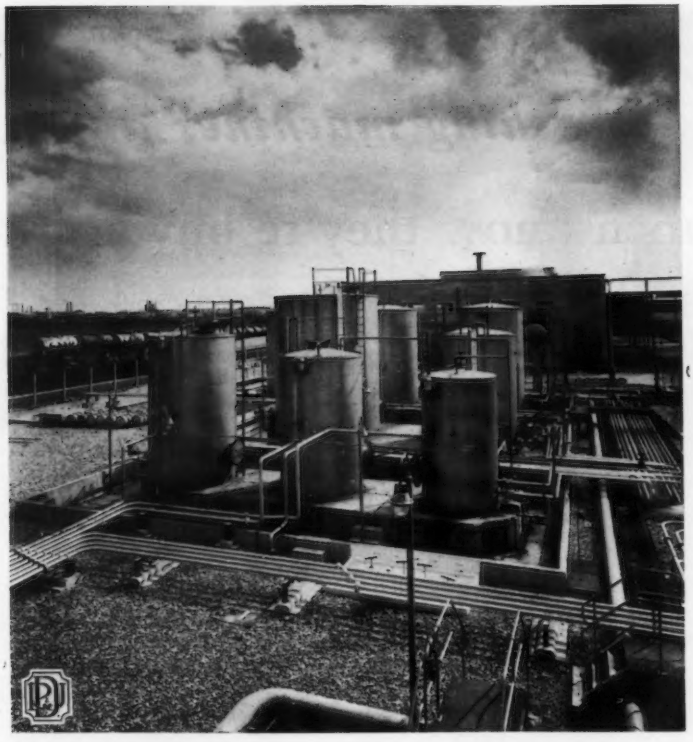


The BRYAN DONKIN CO. LTD
CHESTERFIELD (TEL. 3153) LONDON, MANCHESTER

MEMBER OF THE SOCIETY OF BRITISH GAS INDU



The hallmark of high quality plant.

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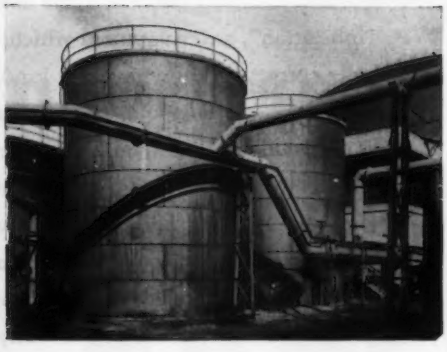
by DEMPSTERS of MANCHESTER



The two illustrations are by courtesy of the Associated Ethyl Co. and the North Thames Gas Board.

We make stills and tanks of cast iron or steel ; tanks with open or closed tops ; with dished, coned, or flat ends ; of cylindrical or rectangular form ; of bolted, riveted, welded or pressed construction ; with trussed self-supporting crowns ; and for the storage of liquor, oil, spirit, tar, water, etc.

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MAKERS OF HIGH QUALITY
BY-PRODUCT and CHEMICAL PLANT - CONDENSERS - CONNECTIONS and VALVES - DETARRERS - GASHOLDERS - IRON CASTINGS - PURIFIERS STILLS - TANKS - WASHERS - WELDED and RIVETED STEELWORK

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A

When washing machines are Acme-fitted

then women know they're buying the best...

WOMEN are buyers of washing machines. Women are buyers of wringers. And when women think of wringers they think of the Acme. So when your machines are Acme-fitted your customers know that they must be, like the Acme, the best on the market.

Seventy years of good, solid British manufacturing, skill, research, and experience stand behind each Acme—and generations of women know this to be true. Acme is the perfect expression of real and continuous progress in the history of wringing. Thus, every feature for which Acme is famous, has sprung from a known need; has been tested, tried and found successful before it leaves the factory.

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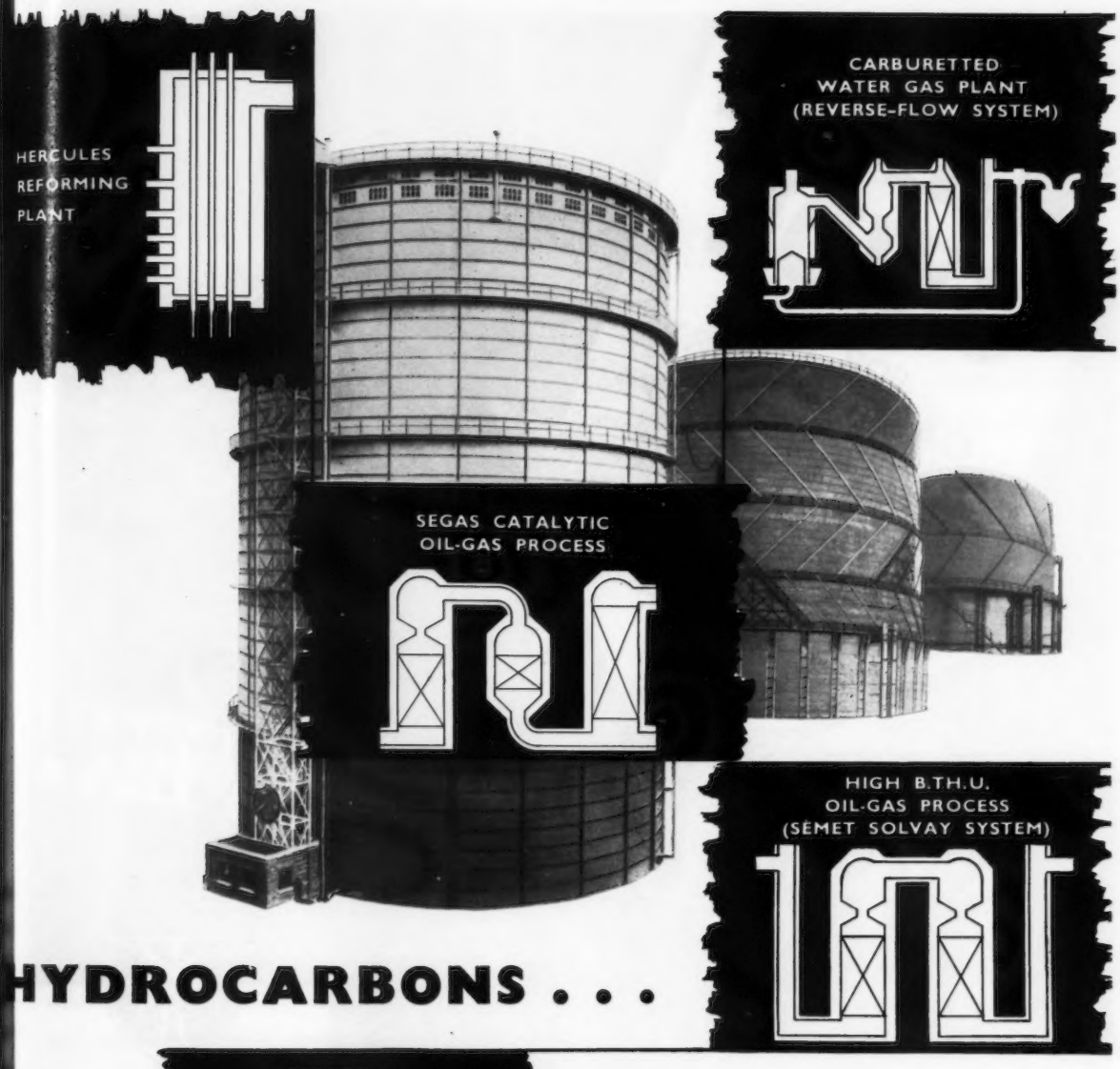
Acme does a better job, lasts longer a gives the best results. That's why Acm reputation is world wide. That's why more th four million women have chosen an Acme preference to all others. That's why, when y washing machines are Acme-fitted, wom know they're buying the best.

ACME WRINGERS LIMITED DAVID STREET GLASGOW SE



HYDROCARBONS . . .

. . . in the service of the Gas Industry

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(THE PARENT COMPANY OF THE POWER-GAS GROUP)

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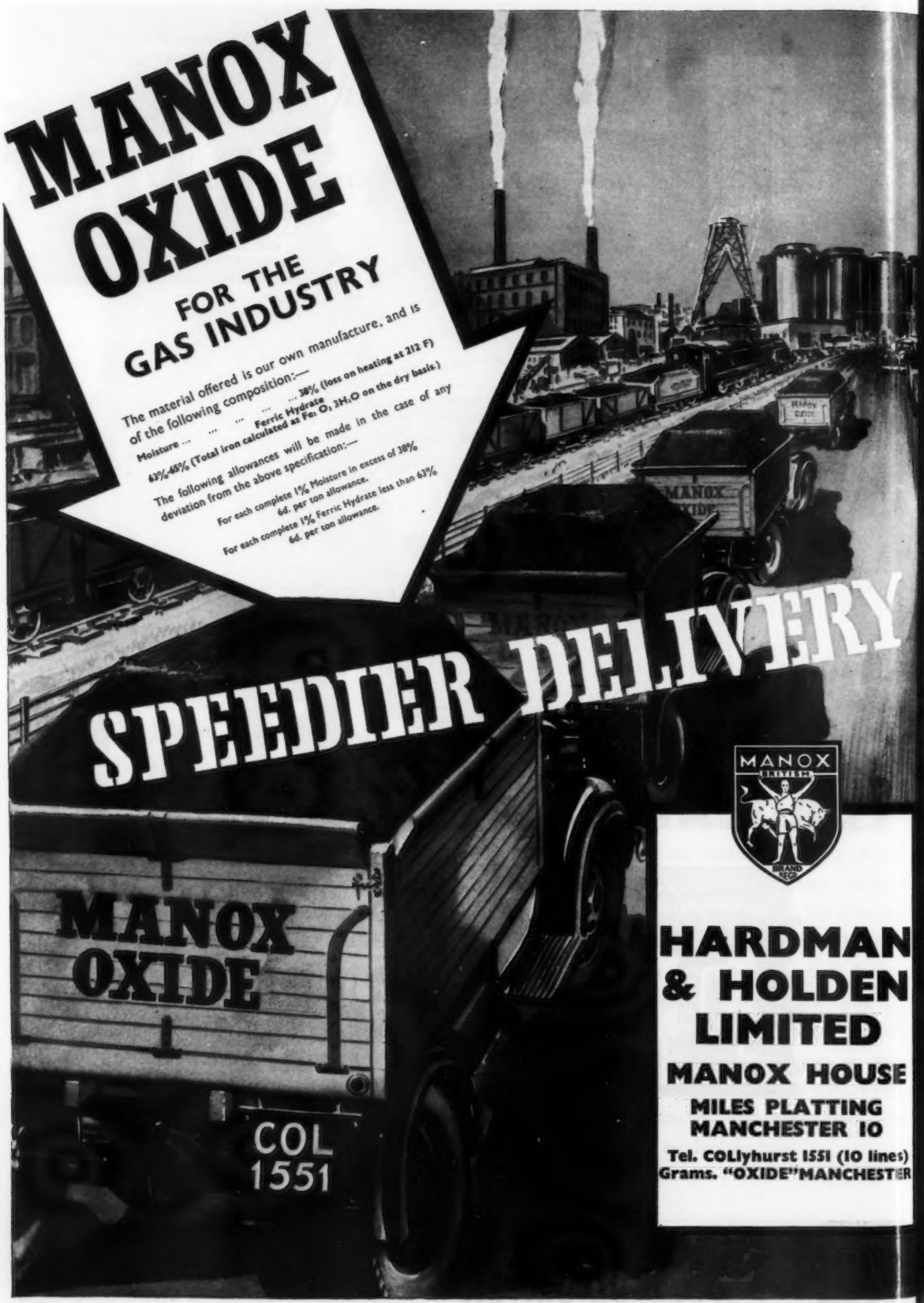
MANOX OXIDE
FOR THE GAS INDUSTRY
The material offered is our own manufacture, and is of the following composition:—
Moisture ... ... 38% (loss on heating at 212 F)
Ferric Hydrate 63%-65% (Total iron calculated as $Fe_2O_3.3H_2O$ on the dry basis.)
The following allowances will be made in the case of any deviation from the above specification:—
For each complete 1% Moisture in excess of 38% 6d. per ton allowance.
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Tel. COLlyhurst 1551 (10 lines)
Grams. "OXIDE" MANCHESTER

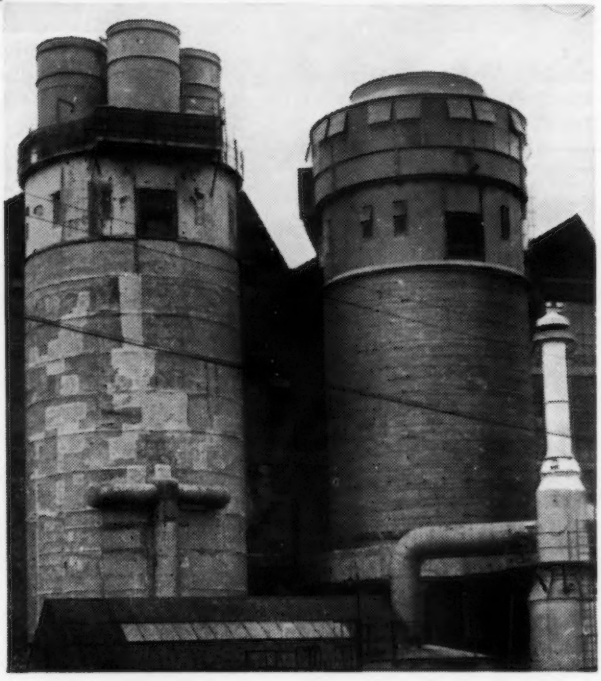
High humidity, high temperature and chemical vapours are part and parcel of the detergent drying process at the works of Joseph Crosfield Ltd., Warrington. The detergent slurry is dried in a tower at 100°C. and when the moisture has been freed from dust, it is exhausted at the top of the tower, via a wet scrubbing system. This process quickly eats into the external steelwork and conventional paints have given only short-lived protection.

THE ANSWER:

a paint that lasts for years

The tower on the right was painted two years ago with an amine-cured paint based on Shell's Epikote Resins. This paint is still in excellent condition and giving complete protection. Contrast this with the left-hand tower, painted with conventional paint at the same time, and used for a far less corrosive process.

For real maintenance savings, ask your paint supplier about paints based on Epikote Resins. The more severe the conditions, the more effective and cost-saving is the protection they offer !



EPIKOTE

EPOXY RESINS

THE NEW POWER IN PAINT

SHELL CHEMICAL COMPANY LIMITED, Marlborough House, 15-17, Gt. Marlborough Street, London, W.1. Tel: GERrard 0666.

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"EPIKOTE" is a Registered Trade Mark.

'IMUNOL' at the 'Home of Steel'

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1. Saves manpower an drastically reduces maintenanc charges.

2. No scraping or derustin required.

3. Will not pick up usual oxid discolouration from water, thereb improving appearance.

4. Unnecessary to put Holde out of commission while bein reconditioned.

Photograph by courtesy of Messrs. Unit Coke & Chemicals Co., Ltd., Associated wi United Steel Companies Ltd., Gasholde at Orgreave Coke and Chemicals Plan protected with 'Imunol'.

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London Office: 348, UPPER RICHMOND ROAD, PUTNEY, LONDON, S.W.15.
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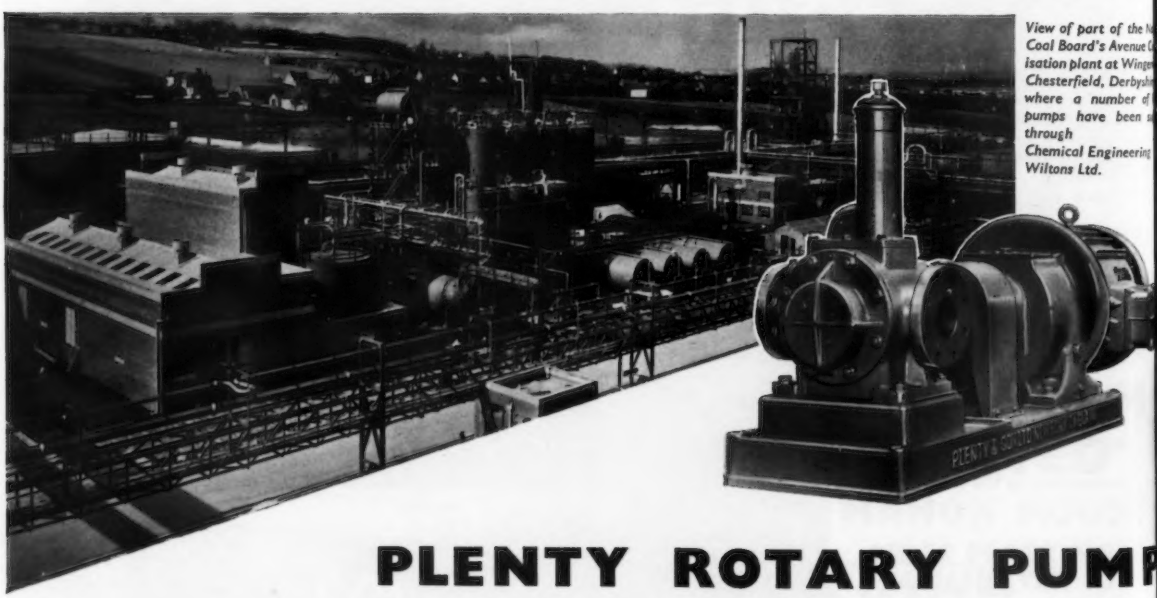
INERTOL CO. LTD., WEST CARR LANE STONEFERRY · HULL

TELEPHONE: 42115 **TELEGRAMS: INERTOLCO, HULL.**



View of part of the N Coal Board's Avenue C isation plant at Winge Chesterfield, Derbysh where a number of pumps have been s through Chemical Engineering Wiltons Ltd.

PLENTY ROTARY PUMP

Wherever difficult materials have to be handled, there you will find Plenty p doing the job with efficiency and economy. Our wide experience of Gas Ind problems enables us to find a practical solution to meet most technical requirem

Do not hesitate to write. Enquiry entails no obligation.

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PLENTY & SON, LTD., Newbury, Berks.

Also makers of FILTERS, MIXING MACHINES and MARINE ENGINES

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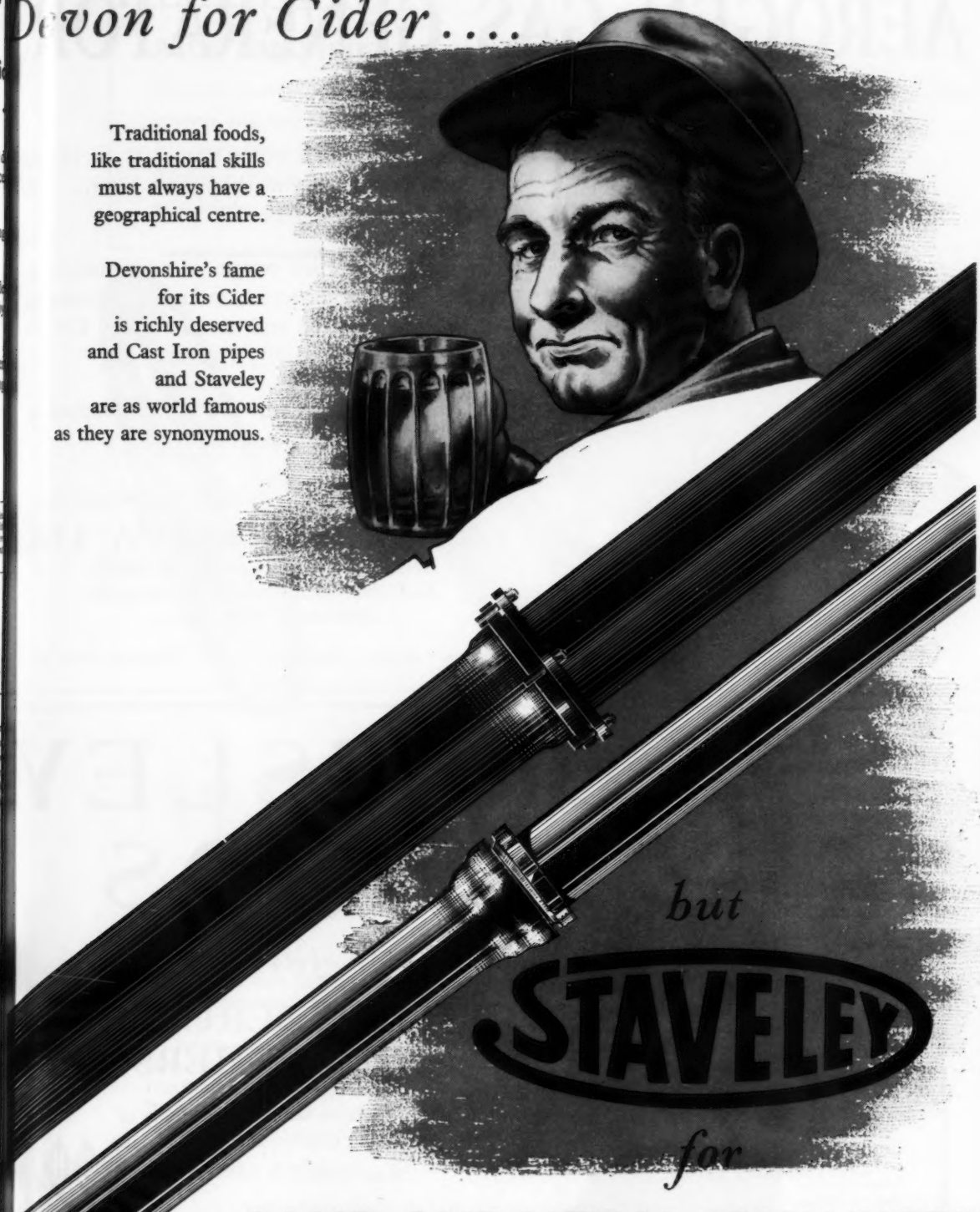
Devon for Cider....

Traditional foods, like traditional skills must always have a geographical centre.

Devonshire's fame for its Cider is richly deserved and Cast Iron pipes and Staveley are as world famous as they are synonymous.



but STAVELEY for

SAND AND METAL SPUN PIPES

(with RUN-LEAD or FLEXIBLE JOINTS)

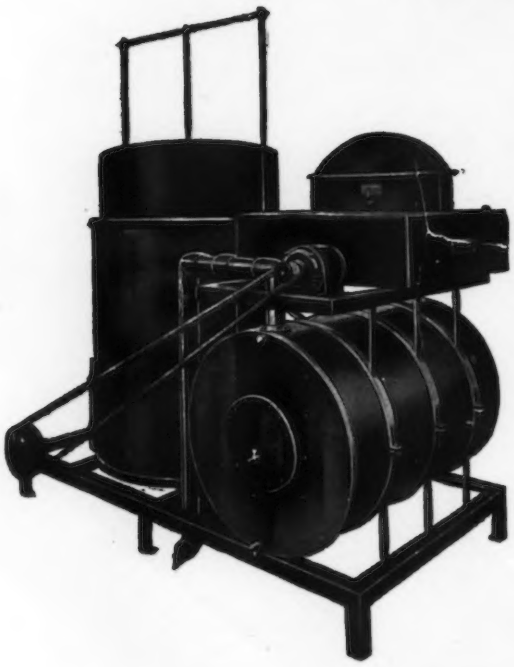
for **GAS MAINS**

THE STAVELEY IRON & CHEMICAL CO. LTD. NR. CHESTERFIELD

June 5,

AEROGEN GAS GENERATORS

(300 B.T.U's per cubic foot)



Single unit capacities range from 100 to 15,000 cu. ft. of Petrol Air Gas supply per hour. One gallon of petrol produces 500 cu. ft.

The Ideal fool-proof system in commission in thousands of laboratories, industrial processing works, etc., at home and abroad where Town's Gas Supply is not readily available.

Conventional Appliances are easily adapted to coal gas burner performance.

Full technical information obtainable from the makers :

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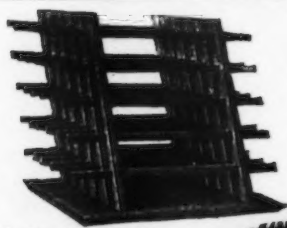
Telegrams : Aerogen, Alton, Hants. *Telephone : Alton 208*

CROSSLEY GRIDS

for

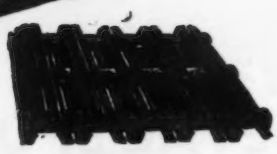
PURIFIERS, SCRUBBERS AND WASHERS



Inclined Hurdles (Light or Heavy Type) with Bottom Flat Grids.

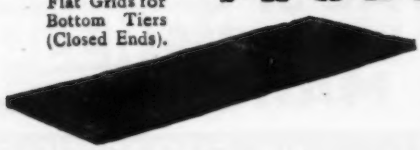
Scrubber Grids.

Open Space Grids or Upper Tiers.



Patent Double-Barred Grids.

Flat Grids for Bottom Tiers (Closed Ends).



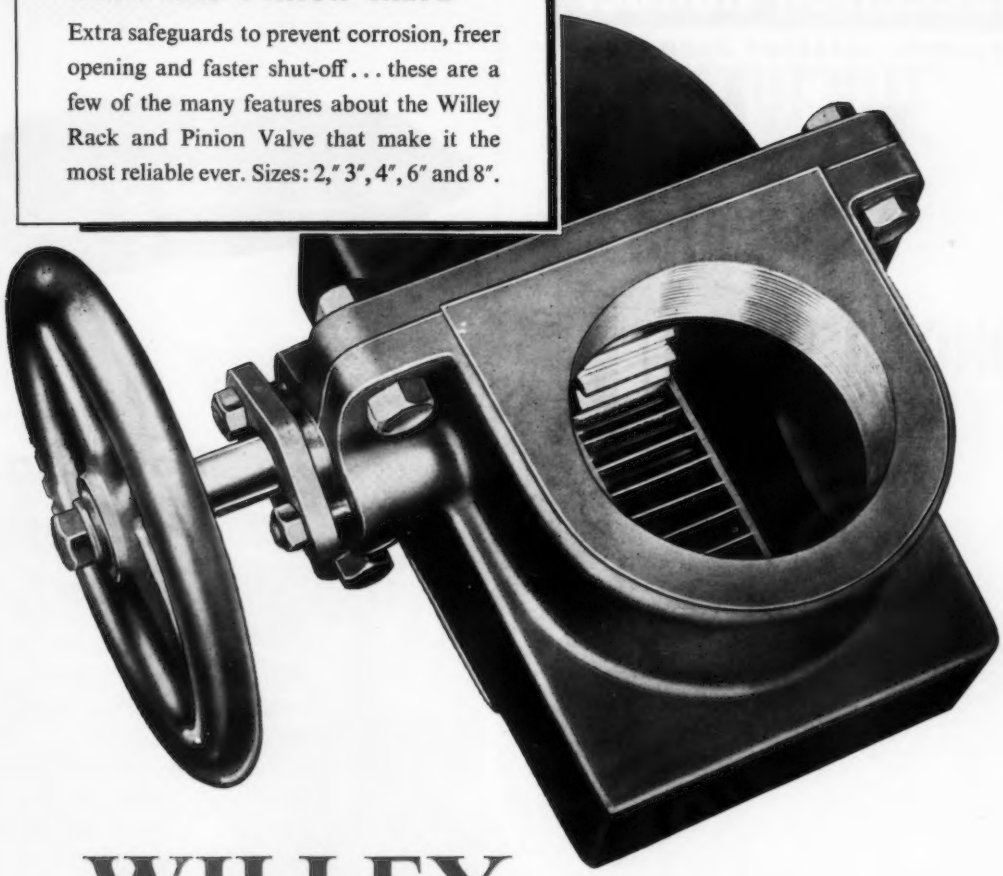
Embody the latest improvements—are of the very best quality—and are in use extensively throughout the Kingdom.

Send your enquiries for any kind of Grids to :—

CROSSLEY BROTHERS,
GRID WORKS, BISPHAM, BLACKPOOL
Telephone : BLACKPOOL 51005 (2 lines). ***Telegrams :*** "WOODWARE, BLACKPOOL."

RACK AND PINION VALVE

Extra safeguards to prevent corrosion, freer opening and faster shut-off . . . these are a few of the many features about the Willey Rack and Pinion Valve that make it the most reliable ever. Sizes: 2," 3", 4", 6" and 8".



WILLEY
PRECISION VALVES

The Rack and Pinion Valve is a typical example of Willey precision castings. Pinion and buffers are made from a specially selected grade of corrosion-resisting bronze. The body seating is kept free from deposit by means of a coil spring action. Possibility of jamming has been virtually eliminated by precision machining of the pinion teeth. An extra-secure packing gland is incorporated, while precision-machined tapers ensure free opening and fast shut-off at all times. The 2", 3", 4" and 6" sizes are available with screwed or flanged ends.

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Cast Iron control valves

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MacLellan Rubber

CARRIES INDUSTRY FORWARD

EVEN WEAR MEANS LONGER WEAR

IN CONVEYOR BELTING

If every foot of a Conveyor Belt is as tough as the next, wear will be more uniform over the whole length. Continual replacement of unserviceable parts will be cut to a minimum, and uneven tension and stress will be reduced.

The advantages are threefold,—better performance, lower maintenance charges and fewer replacement costs.

By continuous vulcanising, experienced compounding and controlled processing MacLellan produce Conveyor Belting that is tough all through. There are various qualities and grades, and one of them is right for your work.

Please Ask.

George MacLellan

AND COMPANY LIMITED

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Telephone: MARyhill 2255-9
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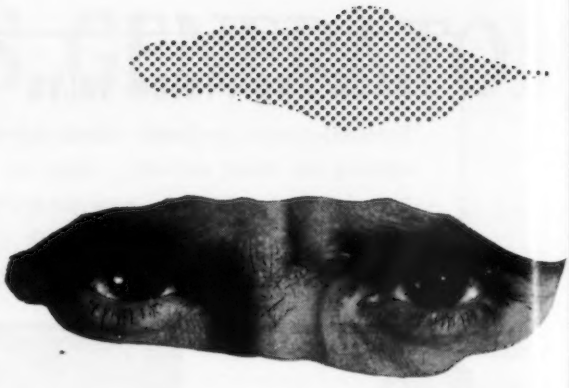
and at:— Burston Road, London. Telephone: PUTney 5678.



Looking for *cheaper* steam?

With the cost of fuel continually going up, how on earth is one to stabilise, let alone reduce, the cost of raising steam?

The most practical answer is to increase the efficiency of the boiler itself, by taking some of the valuable waste heat from the flue gases to pre-heat the feed water, thereby using some 10-20% less fuel for a given amount of steam. In other words, by installing a Senior Economiser. Senior Economisers, with their patented H-gilled heat exchange tubes, combine maximum effective heating surface with minimum resistance to flue gas flow. Straight, uniform gas passages, which do not collect soot, keep draught losses consistently low and rate of heat recovery constant.

The advantages of Senior Economisers apply to any type of boiler burning more than 20 tons weekly of any type of fuel. We build them individually to suit your plant. Capital cost is soon repaid in fuel savings.

Why not write for further details?

Senior H TUBE economisers *for cheaper steam*

SENIOR ECONOMISERS LIMITED, 11 SOUTHAMPTON ROW LONDON, W.C.1. Telephone: Holborn 7543

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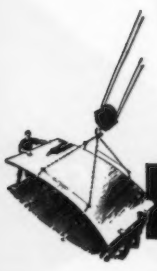
WHESSOE —

AT AVENUE



WHESSOE

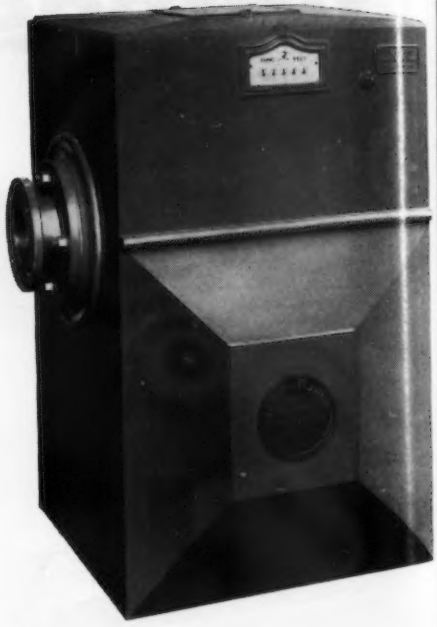
For the National Coal Board's new Avenue Carbonisation and Chemical Plant at Chesterfield, Whessoe received an order from the Woodall-Duckham Construction Co. Ltd. for the primary cooling plant (5 vertical water-tube coolers), the secondary cooling plant (2 vertical water-tube coolers), four W.W.-D. electro-detarrers and three benzole scrubbers (each 13′ 6″ in diameter and 106 ft. high). Included in the order were 2 vertical storage tanks (each 34 ft. in diameter) and 14 horizontal storage tanks (each 9 ft. in diameter and 25 ft. long). (Photograph by courtesy of the Woodall-Duckham Construction Co. Ltd.)

An advertisement of WHESSOE LIMITED Darlington and London

A NAME THAT REGISTERS

A.G.S

INDUSTRIAL GAS METERS



A comprehensive range of Meters in either large or small cases with capacities from 700 to 9000 cu.ft. per hour. Constructed from first-grade Staffordshire Charcoal Tinplates.

OWEN THE OWEN ORGANISATION

A. G. SUTHERLAND LTD.

WARWICK RD · GREET · BIRMINGHAM,

and at LONDON and NOTTINGHAM.

THE R&B Cokemaster

WILL SIZE YOUR STOCKPILE...

FOR THE HIGHLY LUCRATIVE DOMESTIC MARKET

RIDE & BELL LTD., RETFORD, NOTTS.

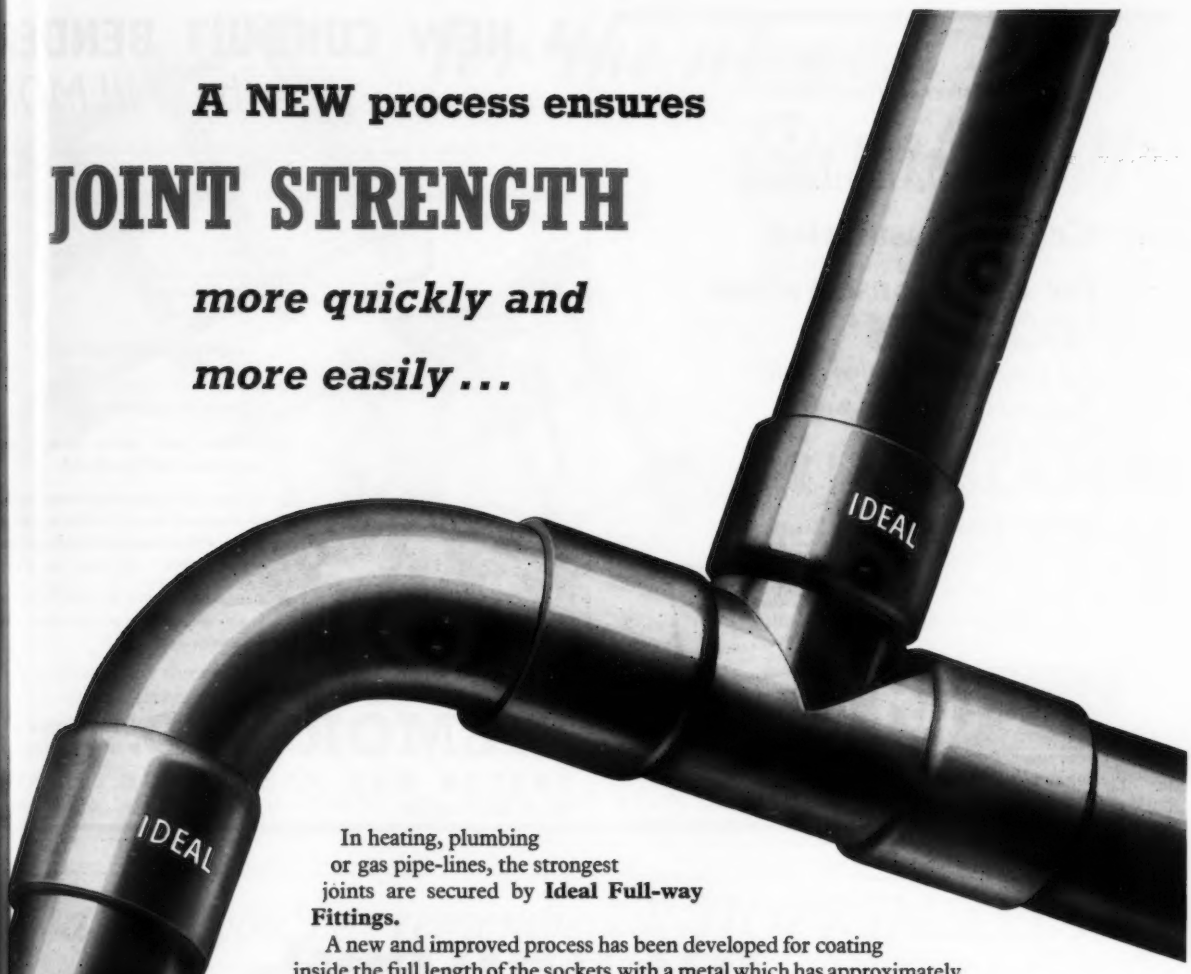
Phone: RETFORD 180 Grams: RIDBEL, RETFORD, NOTTS.

A NEW process ensures

JOINT STRENGTH

more quickly and

more easily...



In heating, plumbing or gas pipe-lines, the strongest joints are secured by **Ideal Full-way Fittings.**

A new and improved process has been developed for coating inside the full length of the sockets with a metal which has approximately the same melting point as solder. This renders the securing of perfect joints a simple and speedy operation.

Ideal Full-way Fittings are ready for immediate use—no cleaning is necessary and no time is wasted by having to scour with steel wool on the inside to prepare them for solder.

The internal diameter of the Fitting is the same as that of the tube which seats flush against the shoulder of the Fitting, ensuring a uniform bore throughout and providing unrestricted flow.

Ideal Full-way Fittings are interchangeable and are manufactured for use with British light gauge copper tube. They are unaffected by extreme temperatures and the joints are actually stronger than the tube itself.

In order to test their efficiency under pressure, a number of Ideal Full-way Fittings of varying types and in ½", ¾", and 1" sizes were used to connect several lengths of copper tubing, the joints being soldered in the normal way. The completed assembly was then hydrostatically tested to a pressure of 2,000 lb. sq. in. without leakage or distortion.

IDEAL

Full-way

FITTINGS

IDEAL-Standard

Manufactured by

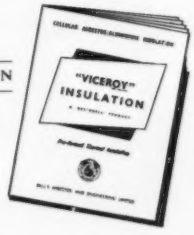
IDEAL BOILERS & RADIATORS LIMITED · IDEAL WORKS · HULL

To readers of *'Gas Journal'*

Asbestos/Aluminium Cellular Insulation for Fuel Conservation

"A guide to insulation made from asbestos paper and aluminium foil."

"Gives details of all types, sizes and shapes available."



A "BESTOBELL" PUBLICATION

For free copy attach this advertisement to your letterheading with your name. Post to "Bestobell", Slough, Bucks.

A NEW CONDUIT BENDER — by HILMOR

The No. 4 Three Point Bender with ratchet actuated ram, adjustable bending head and degree of bend indicator. A sturdy, light-weight machine designed to give long and trouble free service under all conditions.

BENDS: ¼", ⅜", ½", ¾" and 1" gas and steam. (Also ⅝" to 1½" O.D. electrical conduit.)

NOTE THESE FEATURES

- Speedy and accurate bending with minimum of manual effort.
- Produces good quality bends — set double sets, saddle bends, etc.
- Absence of top plate obstruction permits production of bends in similar or different planes with minimum of straight between adjacent bends.
- Designed for bolting to bench, holding in vice or mounting on portable stand with detachable legs.

Send for further details to:

HILMOR LTD. (Sales & Service)

CAXTON WAY, STEVENAGE, HERTS

Phone: Stevenage 881 *Grams: Tubenders, Stevenage*

measured breathing.....

How fascinating to watch the Rana Temporaria (frog to you!) — to see the sensitive pulsations of its pouch.

How interesting to make comparisons with that man-made breathing and measuring device — the modern gas meter. The movement of its diaphragms is equally sensitive .... but the leather itself is immensely more robust.

D. & G. L. Leathers are scientifically selected for thickness, non-porosity and strength, and are processed to give long and accurate metering anywhere in the world.

THE DIAPHRAGM & GENERAL LEATHER CO. LTD.

FRANKLIN ROAD WORKS, PORTSLADE, SUSSEX.

Telephone: Hove 47266/7 Telegrams: DIAPHRAGM, PORTSLADE.

Specialists for over a hundred years in LEATHERS FOR THE GAS INDUSTRY

For the utmost Durability..

Please send for Catalogue No. GJ 858

Top illustration shows screen before use. Bottom illustration shows portion of a similar screen photographed **after screening 8,000 tons of coke.** Despite its very prolonged and arduous service, the screen remained perfectly rigid and no wires were broken.

Woven from steel made to Harvey's own special analysis

'HARCO'
SPECIAL HARD QUALITY STEEL
WIRE SCREENS

offer the maximum resistance to abrasion and fracture from fatigue. They may be relied upon to give the utmost satisfaction under the most gruelling conditions.

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after you've remembered HOPKINSONS

you can forget your

SMALL BRONZE VALVES

Here is a range of valves, any one of which can be relied upon to serve for years of trouble-free operation. They embody, for instance, our 'Platnam' alloy for valves and seats, and incorporate the same principles of design and excellence of materials as the larger Hopkinsons' Valves. Available up to 2" bore in many designs; write for Catalogue No. 951 - 'Bronze Valves'

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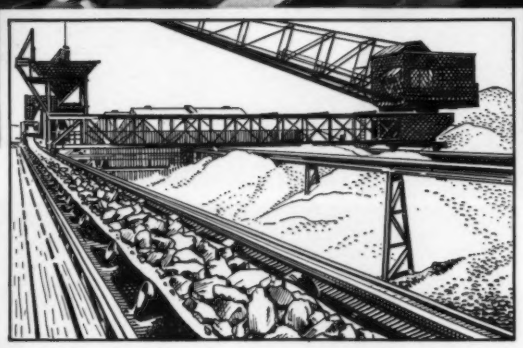

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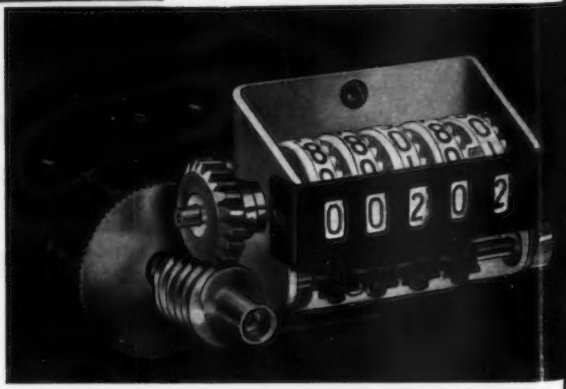

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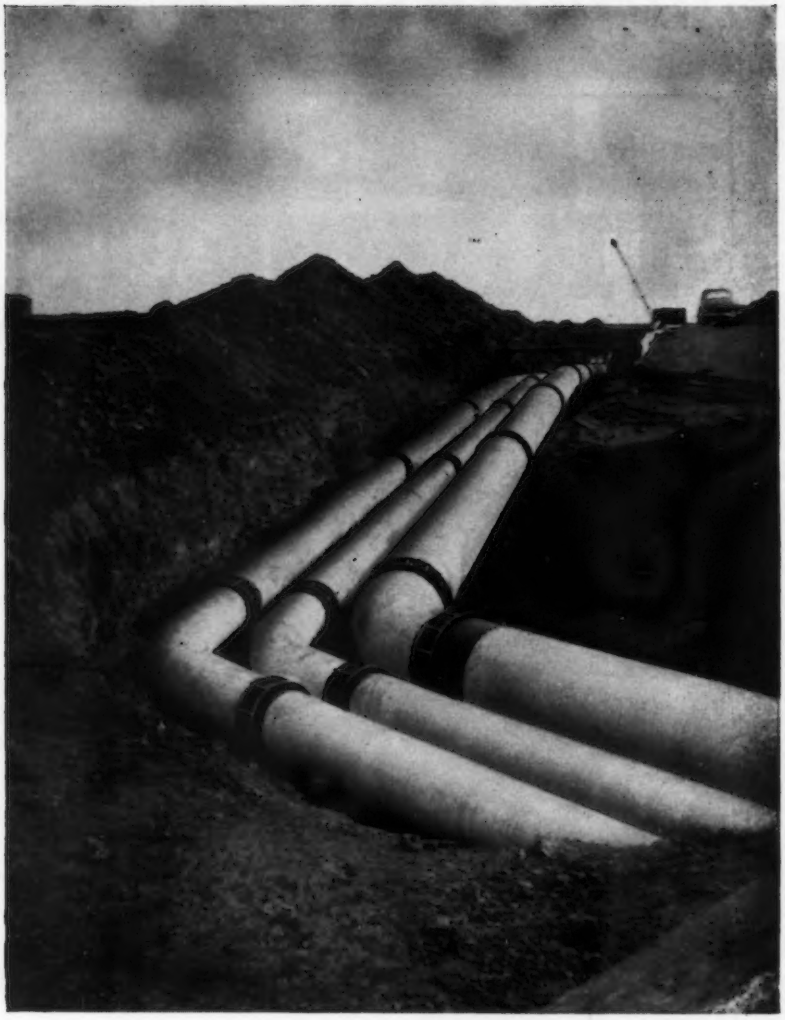

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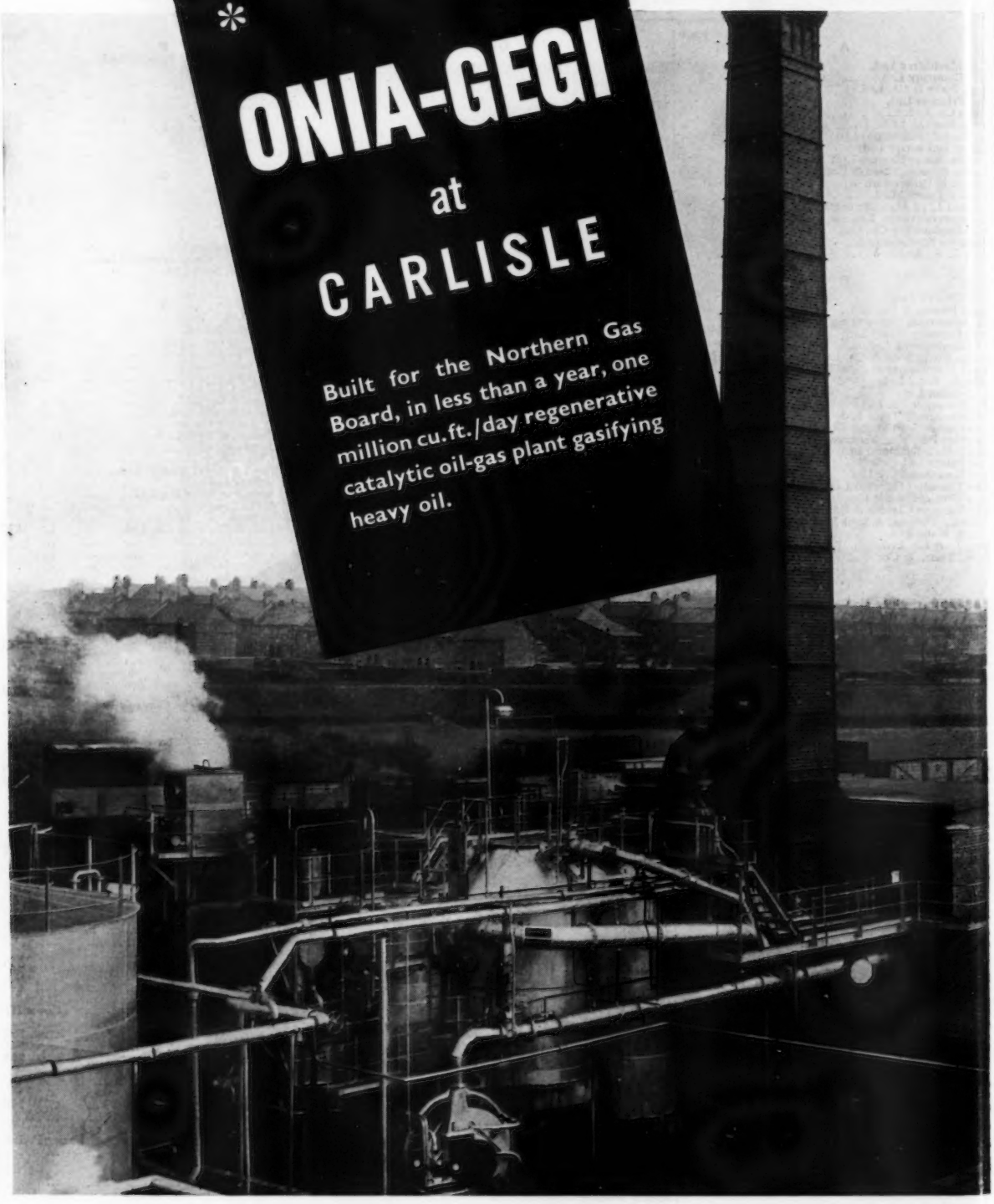
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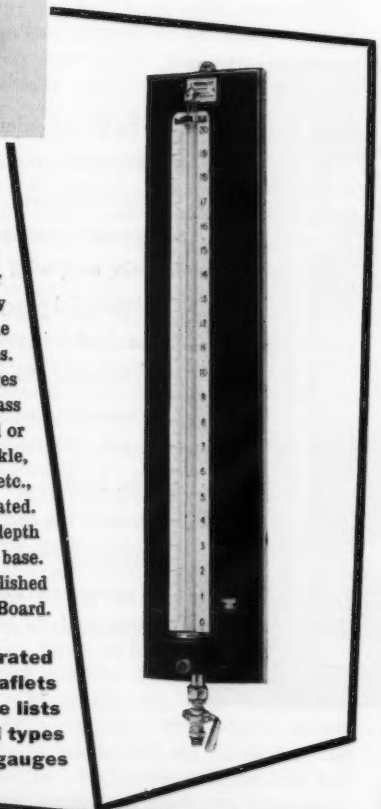

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Gas Journal

VOL. 290 NO. 4899 June 5, 1957

109TH YEAR

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TECHNICAL EDITOR: Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M. Inst. F.

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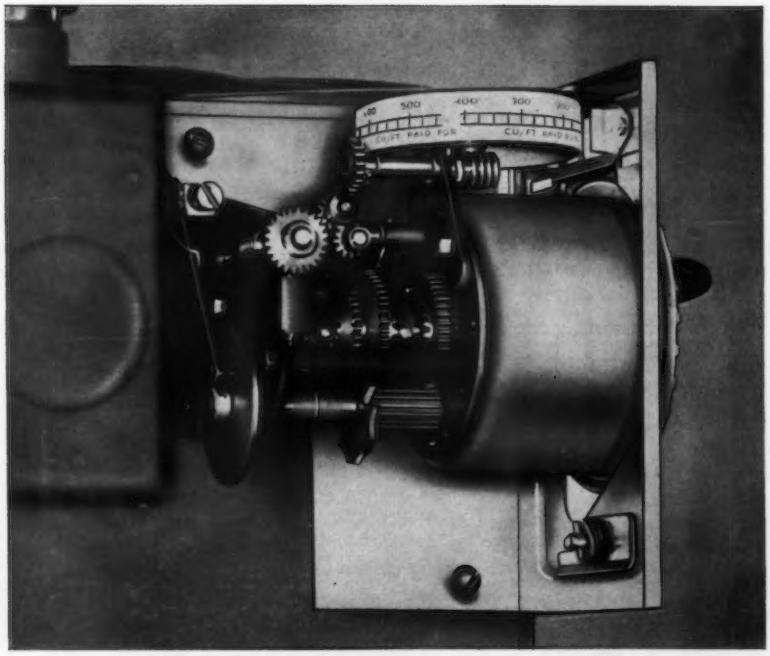

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Gas Journal

VOLUME 290. No. 4899. JUNE 5, 1957. 109th YEAR

Fair Play for the Makers

IT is surely no exaggeration to state that the relationship existing between the gas industry and the manufacturers serving it—we are thinking here of makers of domestic appliances—is more intimate than in any other industry. The roots of this relationship go deep and are firmly bedded; from them strength has been drawn to sustain one partner or the other through times of stress. Never perhaps in this long history of co-operation and mutual confidence have the bonds between gas maker and appliance maker been as strained at the present time. For this there are several reasons, some of them stemming from the natural condition of the competitive appliance market—and which must therefore be adjudged unavoidable—and others which are a direct result of the complications enforced by the gas industry's testing and sales machinery.

The partnership between the two parties is so old-established that through the years there has grown up in certain quarters a conviction that the fortunes of both sides are inextricably bound together. A little thought reveals that this is based on a false premise, for although the gas industry is admittedly entirely dependent on the manufacturers for its appliances, the makers are only dependent on the industry as long as they limit their manufacture to gas appliances. In other words, if the gas boards no longer provide a profitable outlet for their products the makers are quite free to turn to fresh fields and markets new. One has only to think of the interest taken in oil by such companies as De La Rue and Parkinson to appreciate that what might have started out as a second string could if the need arose be developed into a very substantial interest. Oil is not the only temptation. There is no reason why a company whose name stands in high repute with the public should not break into the electric appliance industry. Naturally we hope that will not happen, and indeed we do not think any large-scale swing away from the gas industry need take place. What should be appreciated, we feel, is that to a considerable degree the makers' decision will be governed by the industry's attitude towards them.

Take the business of testing, for example. Apart from minor criticisms we do not think there are many who would deny the excellence of the Gas Council testing centre, both technically and co-operatively, so to speak. There is good reason to suppose that the time elapsing between the date of submission of an original design or original prototype and the approval of the item by the Gas Appliance Selection Committee has been substantially reduced. Having successfully negotiated this ordeal the manufacturer should be able to feel that the success of his product rests with the personal taste of the consumer. But can he? On the contrary; more often than not his troubles are only just beginning.

In the first place there is no guarantee that his product will be accepted by *one* board, let alone 12. In the worst case quoted to us Gas Council approval resulted in an immediate entrée into only two boards, while four boards requested alterations to the 'approved' specification and nine insisted on re-testing the 'approved' appliance before adoption. Even when an appliance has been adopted by a board this does not automatically provide access to all divisions, groups, districts and branches. Sometimes the writ of a board headquarters is insufficiently strong to overcome the personal vagary of, say, a divisional general manager. There is little evidence of a board seeking the opinion of the men on the showroom floor, despite the fact that they are in direct contact with the public upon whom the very life of the industry depends. In our view any board considering the addition of a certain appliance to its list should canvass the opinions of its salesmen and their approval or otherwise should be one of the factors on which the board's decision is based.

Obviously it is in the gas industry's interest to encourage the production of the best and most modern appliances that can be obtained. Those appliances are needed—needed so urgently that gas boards cannot afford to miss any chance of encouraging and co-operating in the development and promotion of something worthwhile. Yet the way in which new appliances are accepted, or rejected, sometimes reveals a lack of any apparent appreciation of present-day conditions. We know cases where a new appliance of unquestionable superiority to existing models has been rejected on the grounds that the board's existing list of such appliances was long enough. There was no question of replacing

an existing appliance on the list by the new one on the grounds that this would strengthen the board's competitive armour. As it happens the new appliance to which we refer was intended to replace an earlier model by the same manufacturer which was already on the list. What is even more remarkable is that the 'list' referred to totalled *three* appliances! This may be an extreme case but the fact that such a thing can happen is a disquieting reflection on our commercial policy.

Another matter which gives manufacturers genuine cause for grievance is the practice followed by several gas boards of allowing their stocks of appliances to drop to a dangerously low level prior to the end of the financial year in order to show a more favourable financial position. While we appreciate the boards' reasons for acting in this way, it is unfortunate that they show no apparent understanding of the hardship caused to the manufacturer by this practice, nor indeed of the fact that ultimately it is the consumer who has to suffer. All manufacturers are dependent on a steady rate of production for a moderately priced article and a sensible economy. That fact should be taken into consideration when boards place their orders. As we have already stated, the industry *cannot afford* to place manufacturers in an impossible situation.

We all look forward to a future in which commercial conditions in the industry will be stable and rewarding. That end can only be achieved by the old gas partnership of appliance maker and gas company or board continuing in harmony and with mutual help and co-operation. Neither partner enjoys the luxury of the varied retail outlets which are a feature of the electricity industry. Broadly speaking, the public must buy at gas showrooms and in many cases these showrooms are such that the gas appliance is handicapped in its appeal to the housewife. Somehow or other dealer schemes must be made to work and the number of retail outlets for gas appliances increased; then with the benefit of a 'seal of approval'—a psychological 'gimmick' which is widely favoured among the makers—gas appliances can be brought to a wider public. In the meantime let us give the appliance manufacturers all the help we can.

Retort House Efficiency

THE need for increased efficiency was forced upon the industry the moment the second world war broke out. The blackout, the danger from air raids, the interruption of supplies, and the shortage and poor quality of coal supplies all helped to instill into everyone concerned the need for the highest possible standards with the lowest standards of raw materials. Great Britain very soon became efficiency-minded and the Ministry was ready to assist the smaller undertakings by setting up regional bodies to look after gas manufacture and to advise throughout those regions. Many saw the advantages of proper scientific control in the retort house, the proper keeping of records, and the better deployment of labour through the works. Since vesting day the process has been pushed even further and inefficient, obsolete gas-making plants have been shut down and gas found from somewhere else by constructing integrated grid schemes. In fact, we have all become efficiency conscious and see no reason why the inefficient plant should not cease to produce gas and be painlessly put out of its misery.

The stress on efficiency is, however, not universal throughout the islands round Britain and our neighbour across the water is perhaps feeling some of the real pains from irresistible economic pressure. In Ireland where the making of gas in large works to supply a number of smaller works is unheard of, where really up-to-date plant is the exception, and there is no overriding authority over the gas industry as there is in Great Britain, each undertaking must rise or fall on its own exertions, and if it fails it goes out of business.

It was therefore of great interest to the Irish gas industry to listen to the paper by A. F. Cottrell and T. W. Austen, both of the Woodall-Duckham Construction Co., Ltd., at its Spring Meeting at Wexford. This paper, entitled 'Efficiency and Economics of Coal Carbonisation,' sets out the basic principles in retort house management, the advantages to be gained from the use of certain carbonising plant, and the effect on the quantities of the products obtained by the employment of these principles by competent works chemists. We are publishing an extract from this paper since we feel that it is useful for all our readers who are interested in retort house management to have these principles laid out clearly for future reference.

Harrogate Wha' Ha'e

WE have the assurance of the organisers of the Gas Sales and Service Conference at Harrogate on October 1-3 this year that there will be no early morning bagpipes for the Lads and Lasses. Unfortunately, however, there will also be no golden-voiced Doreen. However, whatever diversions are in store for us, there is also a very solid and useful programme, commencing with a session entitled 'Organising for Sales Success,' under the chairmanship of Mr. C. H. Leach, Chairman of the Southern Gas Board; followed in the afternoon by an industrial session named 'Competition,' under Mr. R. F. Hayman, Industrial Gas Officer, the Gas Council. There will also be three commercial sessions: 'Marketing and Servicing—the Missing Link,' under Mr. J. W. Rodgers, Sales and Service Officer, N.W.G.B.; 'Shops as Selling Outlets,' under Mr. S. A. King, Commercial Manager Eastern Gas Board; and 'Adventure in Production and Selling,' under the Chairman, Mr. Norman Hudson, Chief Commercial Officer, N.E.G.B. Each of the last four meetings will be repeated the following day.

Also on the next day (Wednesday) will be an address by the Sessional Chairman, Mr. J. H. Dyde, Deputy Chairman, Eastern Gas Board, on 'Some Aspects of Sales Training in the Gas Industry.' Mr. Charles C. Knights, Director, Intensive Sales Education, and author of the Sales Training Manual; Mr. Dorian Hill, Training and Education Officer Southern Gas Board; Mr. J. W. Rodgers; and Mr. Norman Hudson will all talk about the Manual. Mr. Alex Anson, Sales and Advertising Director, Granada TV Network Limited will give an address entitled 'An Approach to Sales Training and the Sales Manual.' Sir Harold Smith, Chairman of the Gas Council will present the Gas Council Challenge Trophy, and Dr. R. S. Edwards will see 'The Conference in Retrospect.'

Finally there will be a reception and dance in the Royal Hall that evening, and on the following day (Thursday) a home service session entitled 'Selling to the Housewife,' and some demonstrations called 'Selling by Showing.' A luncheon by invitation will be given to the home service delegates in the Majestic Hotel.

Personal Notes

MR. S. A. KING, Area Commercial Manager, has resigned from the service of the Eastern Gas Board to join R. & A. Main Ltd., of London and Falkirk, as General Sales Manager. His office will be at Grosvenor Gardens, S.W., and he will be directly responsible to the Company's Sales Director, Mr. C. A. MacLeod, who is particularly well known in the Eastern counties. Mr. King joined the old Tottenham and District Gas Company as an apprentice in 1926 when Sir Harold (then Col. H. C.) Smith, Chairman of the Gas Council, was the Company's Chief Engineer. In 1932 Sir Harold appointed him Industrial Sales Manager, a position he occupied with great success until 1945 when he became Sales Manager, and continued in that position with the Eastern Gas Board in 1949. He was appointed Commercial Manager of the Eastern Area in 1953, his Area office being set up at Epping. Mr. King takes up his new post on September 2, 1957.

MAJOR W. R. BROWN, D.S.O., has been appointed Chairman and Managing Director, in succession to the late DR. N. E. RAMBUSH, of the Power-Gas Corporation of Stockton-on-Tees, parent company of the Group which includes Ashmore, Benson, Pease & Co.; Rose, Downs & Thompson, Ltd., Hull; and subsidiaries in Australia, South Africa, Canada, and France. Major Brown is well known for his work in connection with the design and construction of modern blast furnaces, and has played a prominent part in building new plants required for the industry's expansion of the past two decades. He has been associated with the Stockton company for 30 years, and was appointed to the Board of Directors in 1942 and elected Vice-Chairman last year.

PROFESSOR DR. ERNST TERRES, of the Gas and Fuel Institute of the Technical University of Karlsruhe, has retired after 46 years' teaching and research. After some early work on the use of benzole in internal combustion engines, Professor Terres, who was born in Metz in 1887, specialised in problems concerning gas production and purification. His academic work as Professor at the Technical Universities of Brunswick, Berlin-Charlottenburg, and Karlsruhe was interspersed with years of service in industrial undertakings, including six years on the board of directors of the Didier Company. Professor Terres was a pioneer in his efforts to replace the empirical way of designing and evaluating carbonisation and other gasworks plant by the scientific approach. Under his direction, new methods were developed for the determination of the carbonisation heat of coal as a function of the temperature, also for the calculation of the carbonising period on the basis of the heat conductivity of coal and coke. Other investigations concerned the influence of the coal constituents on the coking process and on the coke quality, and the measurement of the swelling pressure and of the specific heat of coal and coke, leading to a link with the maximum temperature to which the coal had been exposed and yielding valuable information on the origin of fusain. The problem of producing firing gas from small-sized fuel of high ash content was solved by the regenerative shaft furnace with a bottom section of solidified porous slag. There followed investigations of the formation of water gas from coke and semi-coke, of the reactions of the sulphur in the fuel during gasification and of the formation of methane during gasification under pressure. Improvements in by-product processes included a manganese sulphate process and a process to recover ammonia in the form of urea or of a phosphate compound. The fractionation of low-temperature tar by means of selective solvents was studied and successfully developed in co-operation with the Edeleanu Company. Another series of Professor Terres's researches concerned the phenole fractions of high-temperature coke and the extraction of specific phenols.

MR. C. A. H. FAIRBANK has retired from Radiation Ltd., where he has recently been responsible for the operation of the Group personnel and training scheme. Mr. Fairbank joined Richmonds Gas Stove Co. Ltd., in 1934, was appointed General Manager of George Glover and Co. Ltd., in 1944, and has been Administrative Training Officer to the Radiation Group since 1950. His position has been taken over by MR. HAMILTON COATES at Radiation House, Stratford Place, W.1.

MR. WALTER J. TUCKER, who is well known in the gas industry for his work in connection with the instrumentation of many of the big integration schemes, has left Elliott Bros. (London), Ltd., to become Sales Manager of the Industrial Instruments Division of Firth Cleveland Instruments, Ltd. This recently-formed subsidiary of Simmonds Aerocessories, Ltd., will be engaged in the manufacture of many instruments employing advanced techniques and design principles.

MR. PHILIP CASTON FORBES, formerly Deputy Group Manager to the Scunthorpe Group of the East Midlands Gas Board, has been appointed Deputy Engineer and Manager of the Swansea Undertaking to fill the vacancy created by the appointment of MR. L. GRAY as Engineer and Manager of the Pontypridd Undertaking, Wales Gas Board.

MR. J. O. ROBERTS has been appointed Manager of the National Coal Board's Trimdon Grange coking plant. Mr. Roberts, who was awarded a British Coking Industry University Scholarship, is the first of the B.C.I.A. scholars to attain the post of coke works manager.

MR. ROBERT E. WELLS has been appointed District Manager for the Dearn Valley District of the Sheffield and Rotherham Division, East Midlands Gas Board, and will take over his new duties on August 1. Mr. Wells has been Distribution Engineer, Swansea Undertaking, since 1954.

MR. ARTHUR F. SPEAKMAN, mains foreman at the Goswell Road depot of the North Thames Gas Board, has retired on pension after 48 years in the gas industry.

Obituary

MR. VERNER RUSSELL CHADWICK, inventor of the turbine furnace and founder of the Turbine Furnace Co., Ltd., of Grays Inn Road, London, W.C.2, of which he was Managing Director and Chief Engineer, has died.

Diary

June 6.—SOUTH WESTERN G.C.C.: City Council Chamber, Art Gallery Museum, Tavistock Road, Plymouth, 11 a.m.

June 12. — COMBUSTION ENGINEERING ASSOCIATION: St. Ermin's Hotel, Westminster, London, S.W.1. 'Coal: Some Forecasts,' by R. J. Moffat. 10.30 a.m.

June 12.—I.G.E. LONDON AND SOUTHERN SECTION SUMMER MEETING: Visit to Coryton Oil Refinery, Essex.

June 13.—MIDLAND JUNIORS LADIES' DAY: Ringwood Hall, 12 noon. Visit to works of the Staveley Iron and Chemical Co. Ltd., near Chesterfield.

June 14.—SCOTTISH G.C.C.: Scottish Gas Board, 26, Drumsheugh Gardens, Edinburgh, 2.30 p.m.

June 14.—SCOTTISH WESTERN JUNIORS ANNUAL GOLF OUTING: Cardross Golf Club, 1.30 p.m.

June 15. — LONDON AND SOUTHERN JUNIORS SUMMER VISIT AND LADIES' DAY: Visit to Portslade Works. Motor-coach tour to Parham Park.

June 15.—EAST OF SCOTLAND JUNIORS: Annual Outing, starting from Edinburgh.

June 15. — LONDON AND SOUTHERN JUNIORS: Brighton. Ladies' Day.

June 20.—NORTHERN JUNIORS A.G.M.: Tynemouth, 2.30 p.m.

June 20.—MIDLAND JUNIORS: Ladies' Day.

June 22. — WESTERN JUNIORS: Ilfracombe. Summer Meeting and Ladies' Day.

June 26.—THE INSTITUTION OF GAS ENGINEERS, SOUTH WESTERN SECTION: Summer Meeting and Ladies' Day.

Correction

The second illustration on p.515 of our last week's issue showed Mr. D. A. Sime, of Thomas Glover & Co., Ltd., talking to Mr. Hibberd, of New Zealand. We regret the inaccuracy of our caption.

New Smokeless Zones Proposed in Scotland

SMOKELESS zone proposals for Perth and Kirkcaldy were mentioned at the annual conference of the Scottish Division of the National Smoke Abatement Society at Dundee recently.

Dr. R. Ritchie, Convener of Public Health, Perth, said the use of smokeless fuel as a condition of council house tenancy must come soon. This meant interference with the liberty of the individual in his choice of fuel, but the Clean Air Act embodied a national decision to renounce that liberty as applied to freedom to poison one's neighbour's lungs.

Reasonable Demand

Mr. J. Page, chief sanitary inspector, Kirkcaldy, said that if domestic consumers were to be compelled to use coke it was reasonable for them to demand a high-quality product. The gas industry should face the matter quickly if it intended to carry the public with it. Mr. J. Marshall, Dundee district of the Scottish Gas Board, said that when it became compulsory to supply better coke, they would be in a position to toss the bad coal back to the Coal Board and say they didn't want it.

Bailie J. Cook, Kirkcaldy, said that most of the people in Kirkcaldy district were miners who got their concessionary bag of coal for roughly 11¼d. They would have difficulty in getting them to pay 7s. 10d. a sack for coke. Mr. Page said that arrangements had been made for miners living in smoke control areas to receive a payment in lieu of the coal.

CLEAN AIR TALKS HELD IN DUNDEE

THE annual conference of the Scottish Division of the National Smoke Abatement Society, held in Dundee on May 23-24, under the Presidency of Mr. John Innes, Chief Sanitary Inspector of Paisley, was attended by local authorities and other members of the Society from all parts of Scotland.

The first speaker, Bailie Dr. Ritchie, Public Health Convener, City of Perth, dealt with the responsibilities of local authorities under the Clean Air Act. Mr. John Page, Chief Sanitary Inspector, Kirkcaldy, read a paper on smoke control areas; while an industrialist, Mr. James Strachan, O.B.E., of Jute Industries, Ltd., spoke on the impact on industry of the Act.

Health hazards of air pollution was the subject of a talk by Prof. A. Mair, of the Department of Public Health and Social Science, St. Andrew's University; while a progress report was given at the close of the conference, by Mr. Arnold Marsh, O.B.E., Director of the Society.

Catering Panel Visits Stotts

On the occasion of the recent visit of the Gas Council Catering Panel to Stotts of Oldham, a tour was made of the main departments of the works during which a wide range of equipment in all stages of manufacture was seen. Our picture shows, facing the Panel Chairman, Mr. Horsfall, Mr. Rowlands, Mr. Hearne, Mr. Funk, Mr. Bellamy (Stotts), Mr. Cottam (Stotts), and Mr. Pocock, while on the extreme left is Mr. Birchinall (Stotts).

COLERAINE SEEKS WAYS OF MEETING RISING COSTS

COLERAINE (Northern Ireland) Borough Council Gas Committee has recommended the Council to adopt proposals submitted by the Gas Manager (Mr. T. Cameron) to offset rising costs in the Gas Department.

Mr. Cameron recommended that there be no change in the price of gas; that the price of coke be increased from June 1 by 3s. 4d. per ton, and that the price of all breeze by 10s. per ton. The estimated effect of these increases would be to reduce the deficiency on the Department of £1,929 to £1,602.

The Manager also recommended the repair of four retorts instead of the re-setting of two of them at a cost of £800, a saving in the financial year of £900. The re-setting of two retorts would, however, have to be undertaken in the financial year 1958-59 at a cost of £1,700.

Mr. Cameron reported that the amount of gas manufactured from March 22 till April 26 was 15,214,700 cu.ft., a decrease of 2,134,000 cu.ft. compared with the corresponding period last year.

Record Gas Output

Newtownards (Northern Ireland) Borough Council at last week's meeting were told that the make of gas up to March 31 at the Council's gasworks was 125,205,500 cu.ft. compared with 120,107,000 cu.ft. for the corresponding period last year, an increase of 5,098,500 cu.ft. and the highest ever recorded in the works.

'Coal is the Fuel of the Future'

MR. J. S. WILLIAMS, Director of the Coal Utilisation Council, told a news conference on May 27: 'Coal is the fuel of the future.'

Nuclear energy by itself, said Mr. Williams, could not heat anybody's house, provide one pint of hot water, or grill one small sausage.

Mr. Williams, who was discussing the Council's 1956 report, said that even the additional electricity produced by atomic energy, or by power stations using increasing quantities of imported oil, would be swallowed up by the growing needs of industry. This would remain true for a generation at least.

'Even 20 years from now,' he went on, 'this country will still rely on an expanded coal industry for more than two-thirds of its power requirements.'

WALES AND MON. JUNIORS MEET

AT the annual general meeting of the Wales and Monmouthshire Junior Gas Association in Hereford recently, members were welcomed by Mr. W. H. Blundstone, Engineer and General Manager, Hereford District.

During the business session congratulations were given to Mr. C. J. Pope on his being awarded the Silver Medal of the Society of British Gas Industries for his paper, 'Unaccounted-for Gas,' and to Mr. W. Lloyd Ellis, who received the Bronze Medal of the Institution of Gas Engineers for his paper, 'Pipeline Butt-Weld Inspection by Ultrasonic Methods.'

The Presidential Address by Mr. C. G. Reeve, Assistant Gas Engineer, Wales Gas Board, technical headquarters, was followed, on his special permission, by a discussion.

LONDON AND SOUTHERN SECTION I.G.E. SPRING LUNCHEON

One-fuel or Two-fuel Industry? Public will Decide, says Sir Henry Jones

So long as gas is made by carbonisation one of the best ways of lowering costs is to foster the demand for coke, especially in the home.

This view was expressed by Sir Henry Jones, Deputy Chairman of the Gas Council, when he proposed the toast of the London and Southern Section, Institution of Gas Engineers, at their spring luncheon at the Connaught Rooms, London, on May 28.

Sir Henry said he was sometimes surprised by those who seemed to think that in the implementation of the Clean Air Act, only gas should be used to replace smoky coal.

'Others,' he went on, 'with equal fervour maintain that only coke can do the job. Some even talk as if one could sell either gas or coke but not both.

'In my view, whether or not the gas industry will become a one-fuel industry or remain a two-fuel industry must depend on whether the public is prepared to become a one-fuel public.

Sir Henry said that if the public demanded more gas and less coke the industry could soon adjust its plans accordingly. If, on the other hand, a substantial section of the public wished to go on using solid fuel, the industry could readily supply more coke to the domestic market than is used at present.

'The first indication that the public a greatly increased sale of gas appliances wants more gas,' he continued, 'will be to replace those using solid fuel. As soon as the salesmen can demonstrate a strong trend towards replacement of solid fuel by gas, the engineers will no doubt extend the gasworks with whatever plant will make gas at the lowest cost.

'The salesman may say that he could soon sell more gas-using appliances if gas were cheaper but, if gas is to be cheaper, either he must have the help of the accountant to design a really promotional tariff, or else of the engineers who have got to find new methods of gas manufacture cheaper than those now current.

'My own view is that with our present resources of equipment and of knowledge we should try to sell gas wherever we can for all heating purposes and design our tariffs to be as promotional as our costs will permit, but that so long as much of our gas is made by carbonisation one of the best ways of lowering our costs is to foster the demand for coke, especially in the home.'

Mr. G. Dougill, Chairman of the Section, responded to the toast.

Gas Industry Welcomed

Mr. C. Stott, proposing the toast of the guests, welcomed Mr. Martin Flett, Deputy Secretary, Ministry of Power. 'Mr. Flett is new to us but we welcome him as a potential ally in high places who will do his best to see that the industry is allowed to make its appropriate contribution to the rapidly growing energy requirements of a modern industrial state. We hope that he will realise that the key to these vital extensions of energy supply will be found in engineering practice, and that he will shield us, if the occasion should arise, from the unpredictable blasts of political expediency.'

Commenting on the fact that Sir Harold Smith was unable to be present, Mr. Stott welcomed Sir Henry Jones and Mr. F. G. Brewer, Secretary of the Gas Council, and Mr. W. K. Hutchison, Chairman of the South Eastern Board. The North Thames, Eastern, South Eastern, and Southern Boards were associated with the work of the Section, and the presence of the deputy-chairmen of these boards too was welcomed.

The Institution was represented by Sir Henry Jones, the immediate Past-President, together with Dr. Braunholtz, the Secretary, and Mr. Higgins, Assistant Secretary.

Mr. Stott also mentioned the Chairman and Secretary of the Eastern, and Chairmen of the Midland and Wales Sections, and the President and Secretary of the London and Southern Juniors.

Finally, Mr. Stott welcomed the Technical Press and the members' personal guests.

Mr. Martin Flett replied.

At the business meeting in the afternoon, Mr. G. Dougill, who is Planning Engineer of the North Thames Gas Board, read his Chairman's Address which will be dealt with in another issue.

The following officers for the ensuing session were elected: Chairman, Mr. C. Stott, Senior Vice-Chairman, J. C. Hogg, Bournemouth, Junior Vice-Chairman, R. F. Robinson.

The Chairman announced that Mr. A. F. Grant, the Secretary, was retiring, and that Mr. J. T. Veryard would take his place.

The Association owed Mr. Grant a debt of gratitude for having done an extremely good job of work.

MINISTER OPENS NEW OFFICES FOR OLD FIRM

A NEW office block at the Trafford Park works of Lancashire Dynamo & Crypto Ltd., was opened recently by the Minister of Power, Lord Mills.

Mr. S. F. Steward, who succeeded Lord Mills as Chairman of Lancashire Dynamo Holdings Ltd., the parent Company of the Group, introduced the Minister who unveiled a plaque which will remain permanently in the entrance hall of the new building to record the ceremony.

To Help the Aged

To help, in particular, old people who tend not to have appliances serviced for long periods, the East Midlands Gas Consultative Council is to ask the Board to consider an optional servicing scheme whereby consumers could have gas appliances serviced periodically on payment of £1 or £2 a year.

Company News

Woodall-Duckham —20% Final Dividend

THE Directors of Woodall-Duckham, Ltd., are to recommend a final dividend of 20% on the ordinary shares for the year ended December 31, 1956, making 25% for the year.

At the annual general meeting (June 24) members will be invited to approve an increase in the Company's capital to £1,900,000 by the creation of 3,600,000 new ordinary shares of 5s. each and the capitalisation of the sum of £600,000, being part of the undivided profits of the Company, such sum to be applied in paying up in full 2,400,000 of the unissued ordinary shares of the Company of 5s. each. Treasury consent for the capitalisation operation has been obtained.

Preliminary results:—

	1956	1955
	£	£
Group profit	1,087,064	1,042,682
U.K. tax	549,455	558,564
Leaving (after overseas taxation)	537,609	483,750

Southern Gas Board Chairman Speaks of

WIDER HORIZONS

AT OPENING OF KINGSTON, I.O.W., WORKS

Aerial view of new works.

TWO projects—the new Kingston, Isle of Wight, gasworks and the agreement to supply Fawley flare gas to the Southern Gas Board—have benefited by nationalisation and 'the possibilities of integration afforded by thinking of a gas supply with wider horizons than merely local ones.'

Mr. C. H. Leach, Chairman of the Southern Gas Board, said this at a luncheon to guests aboard the M.V. Balmoral to see the official opening of the Kingston works last Thursday.

'It is, however, true,' went on Mr. Leach, 'that as long ago as 1934 there was a joint meeting of the directors and officials of various gas companies on the Isle of Wight to consider the possibilities of building a central manufacturing station for the Island, such as we have now done.

'Indeed, the Ryde Gaslight Company bought this Kingston site in 1935.'

Welcoming the guests Mr. Leach mentioned, among others, Mr. David Renton, Parliamentary Secretary, Ministry of Power; Sir Peter McDonald, M.P. for the Island; officials of local government; representatives of the Harbour Board and industry; and Sir Harold Smith, Chairman of the Gas Council.

The Duke of Wellington, who performed the opening ceremony, thanked the Southern Gas Board for their hospitality.

Colliers of 2,000 tons capacity bring coal from the Northumberland coalfields to the 200-ft. long jetty where two electric cranes unload it, each being able to deal with 100 tons per hour, and discharge it into two hoppers from which it passes by belt conveyors to a tower in the centre of the jetty.

From this point it can be fed to the power station or to the head house of the drag scraper plant. From this house a system of chutes and conveyors enables the coal to be routed in three ways.

Mr. A. R. Mark, Chairman, Cowes Council; Captain H. J. Grist, Chairman, I.o.W. C.C.; Mr. C. H. Leach, Chairman, Southern Gas Board; the Duke of Wellington; Mr. A. W. Brown, Production Engineer, Wight and Portsmouth Region, S.G.B.

First, it can be placed in store by means of the boom conveyor and the drag scraper unit at a rate of 200 tons per hour; or it can be recovered from store by the drag scraper unit and the lower reclaiming conveyor at a rate of 100 tons per hour, whilst the discharge from the reclaiming conveyor is fed to the coal belt supplying the carbonising plant; or it can be placed in store and conveyed to the carbonising plant simultaneously.

The carbonising installation comprises a bench of five intermittent vertical chamber oven recuperative settings, each containing six 3¼-ton capacity chambers. They are heated by gas generated in built-in producers, and a spare producer gas unit is installed to provide gas to be mixed with the coal gas. Waste heat boilers are provided to raise steam from the heat in the waste gases after heating the chambers.

The plant is designed to produce 3½ mill. cu.ft. of gas per day, and the equipment includes vacuum cleaning plant to preserve cleanliness and a dust and fume extraction unit to improve working conditions. It is also equipped with coal, coke, and ash-handling plants.

The installation is designed to carbonise 250 tons of coal per day, and the coal hoppers have been built to carry 48-hour storage. Space has been left for extension Northwards to include a

further unit of 3½ mill. cu.ft. per day.

The coke is dropped from the intermittent vertical chambers into the coke car, which is taken under the quenching tower and the coke quenched. After quenching, the coke is discharged into a ground level hopper, feeding on to twin coke feeders, discharging on to an inclined band conveyor to a junction tower.

At this point, the coke can either be by-passed to ground storage, or fed on to a crossband conveyor to the grading plant. A belt and bucket elevator adjoins the transfer tower for handling the recovered coke from storage.

There are two parallel operated screen units comprising Pegson scalping units, cutters, and grading screens of the reciprocating tray type, each having a designed throughput of 25 tons per hour. The scalping screen passes all material above 3½ in. to either the cutter or the large coke compartment. Material under 3½ in. is then fed with the coke from the cutter on to specified grading screens.

Bagging and bulk loading arrangements have been made for all grades, the former being mechanically de-breezed by Ace travelling machines in conjunction with Bell Isle weighers. Bulk loading chutes are fitted with static de-breezing screens.

In addition to the waste-heat boilers the steam supply of the works is derived from three Lancashire boilers, two being equipped with chain-grate stokers, and one hand-fired. The boilers are designed to work at a pressure of 120 lb. per sq. inch. The installation is complete with an economiser, grit-arresting, and water-softening plant.

Two Roots type exhausters, each capable of passing 150,000 cu.ft. of gas per hour, are installed, driven by single-cylinder verticle steam-engines. The exhauster engines are designed to exhaust against a back pressure of 20 lb. per sq. in., which will be used for process work.

Wet purification plant includes two vertical tube condensers, a Livesey washer, and an electro static detarrer, together with a static ammonia washer. A forced draught cooling tower is installed in conjunction with the condensers.

These are designed for cooling the full output of gas from the carbonising plant, together with sufficient reserve, so that each condenser could, on overload conditions, take the full output from the extended carbonising plant, thereby providing adequate standby for the initial and future installations. The condensers are of unusual design in that while the bulk of the gas-cooling is done in the centre section, operated by water circulating through the forced draught cooling tower, the final cooling of the gas is carried out by the incoming softened town water feed, which is used as make-up to compensate losses through the

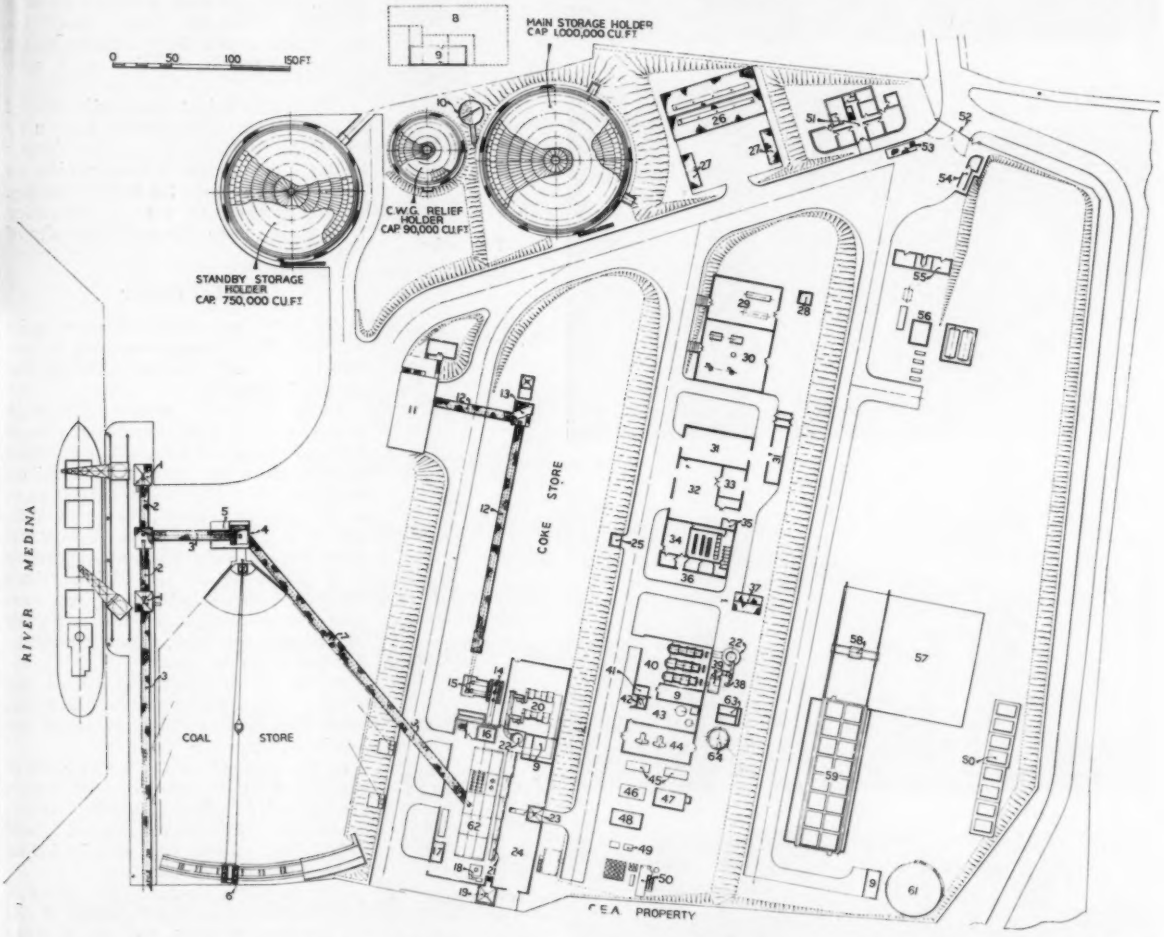
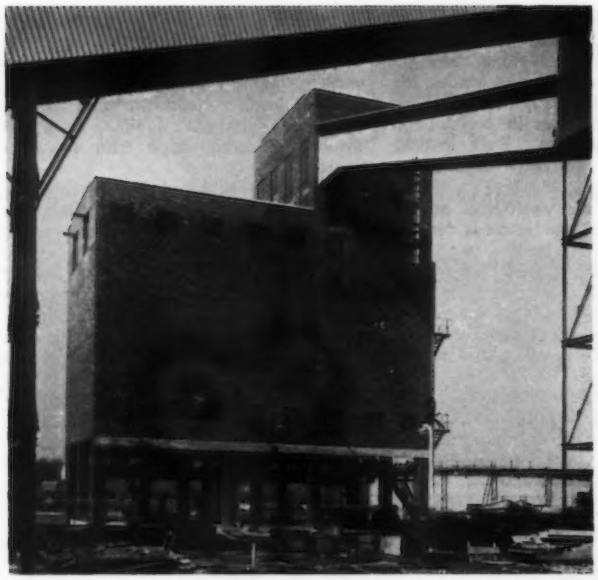
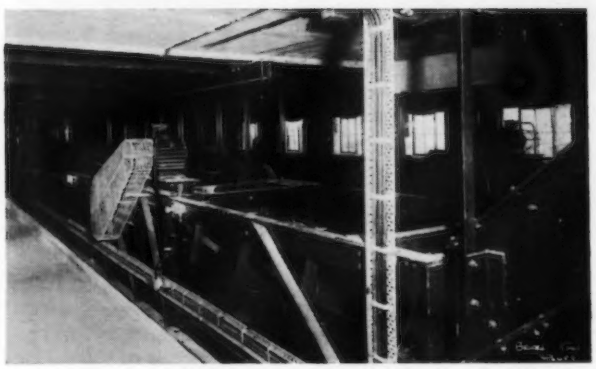


Fig. 1. Key to plan:—1, Coal hopper; 2, coal feeder; 3, coal conveyor; 4, coal junction tower; 5, drag scraper winch room; 6, drag scraper tail car on rails; 7, auto-weigher; 8, tar and liquor storage room; 9, pump room; 10, sewage plant; 11, coke grading plant; 12, coke conveyor; 13, coke junction tower; 14, coke receiving hopper; 15, twin coke feeders; 16, quenching tower; 17, liquor pump house; 18, dilution producer; 19, ash hopper; 20, waste heat boiler room; 21, waste gas main; 22, chimney; 23, coke and standby coal elevator; 24, refractory store; 25, fuel recovery plant hoppers; 26, garage; 27, cycle shed; 28, cooling tower; 29, alternator room; 30, boosters and governor room; 31, stores; 32, workshops; 33, blacksmith's shop; 34, messroom; 35, office; 36, medical room; 37, sludge press house; 38, fan; 39, economiser; 40, boiler room; 41, skip hoist; 42, breeze hopper; 43, water softening plant; 44, exhauster room; 45, condensers; 46, Livesey washer; 47, water cooler; 48, detarrer house; 49, static washers; 50, ammonia concentration plant; 51, office block; 52, entrance gates; 53, weighbridge; 54, gatekeeper's lodge; 55, station meter house; 56, benzole plant; 57, oxide slab; 58, Goliath crane; 59, purifiers; 60, future C.W.G. purifiers; 61, town water storage tank; 62, I.V.C. house; 63, sludge pit; 64, reaction tank.

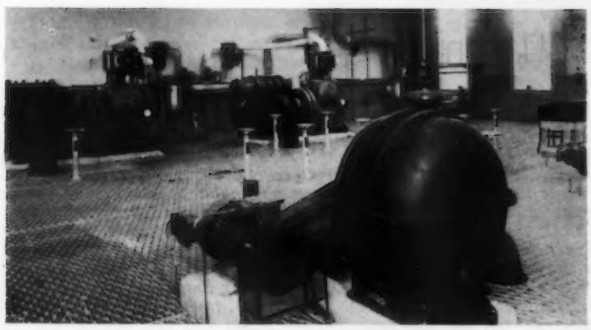


Coke grading plant.



The coke screens.

Carbonisation plant.



Booster room.

cooling tower, and the hot gas entering the condenser is used to pre-heat boiler feed water.

From the outlet of ammonia washers, the gas passes to a set of four mild steel tray type purifiers, having a capacity of 3¼ mill. cu.ft. of gas per day. There are four purifiers in line of welded steel construction, each box containing eight trays.

Gas enters a box in four places, being divided between the eight trays. Each tray contains a central gasway, the gas passing out through ports in the gasway to flow up through the top layer of oxide and down through the lower, and thence to the space between the trays and the outer casing. Two trays form a stack, a gastight flange joint being provided between the gasway of each tray.

In the station meter house, two Connersville meters of 150,000 cu.ft. per hour capacity, complete with P.V.T.T. recording instruments, are installed, one for measuring coal gas, and the other for water gas to be used when the plant is installed. From the station meters the gas passes into a 3-lift, spirally-guided holder, having a capacity of 1 mill. cu.ft.

The overall height when fully inflated is 130 ft. 3 in. The pressure thrown by the holder is 14 in. W.G., and a further holder is in process of construction on the foundation over the river foreshore. It will also be of the spirally-guided type, having three lifts and a capacity of 750,000 cu.ft.

Relief Holder

The water gas relief holder, capacity 90,000 cu.ft., is being completed in preparation for such time as additional gas-making is installed.

A 30 in. main crosses the main approach road from the main storage holder outlet to the booster house, which accommodates two Roots type machines, each capable of delivering 250,000 cu.ft. of gas per hour, at a pressure of 4 lb. per sq. in. They are driven by vertical steam-engines, exhausting at a pressure of 20 lb. per sq. in. In addition, there are two 2-stage electrically-driven fan-type boosters, each capable of delivering 100,000 cu.ft. per hour, against a pressure increase of 44 in. W.G.

Adjoining the booster room is the standby diesel engine-driven alternator, to be used in the event of failure of the public supply.

At the entrance to the works there is the office block, consisting of works administrative offices, drawing office, laboratory, calorimeter room, and weighbridge office. Immediately below is the garage and washing bay.

The ammonia concentration plant is installed immediately to the south of the wet purification plant, and has a capacity of 500 gal. per hour of 10 oz. liquor, concentrating this to a product containing not less than 20% of ammonia.

A well-planned administrative block is included. Stores, works, shops, first aid and medical facilities, and mess rooms are housed in a brick building adjacent to the booster and alternator house. Canteen and washing facilities are provided.

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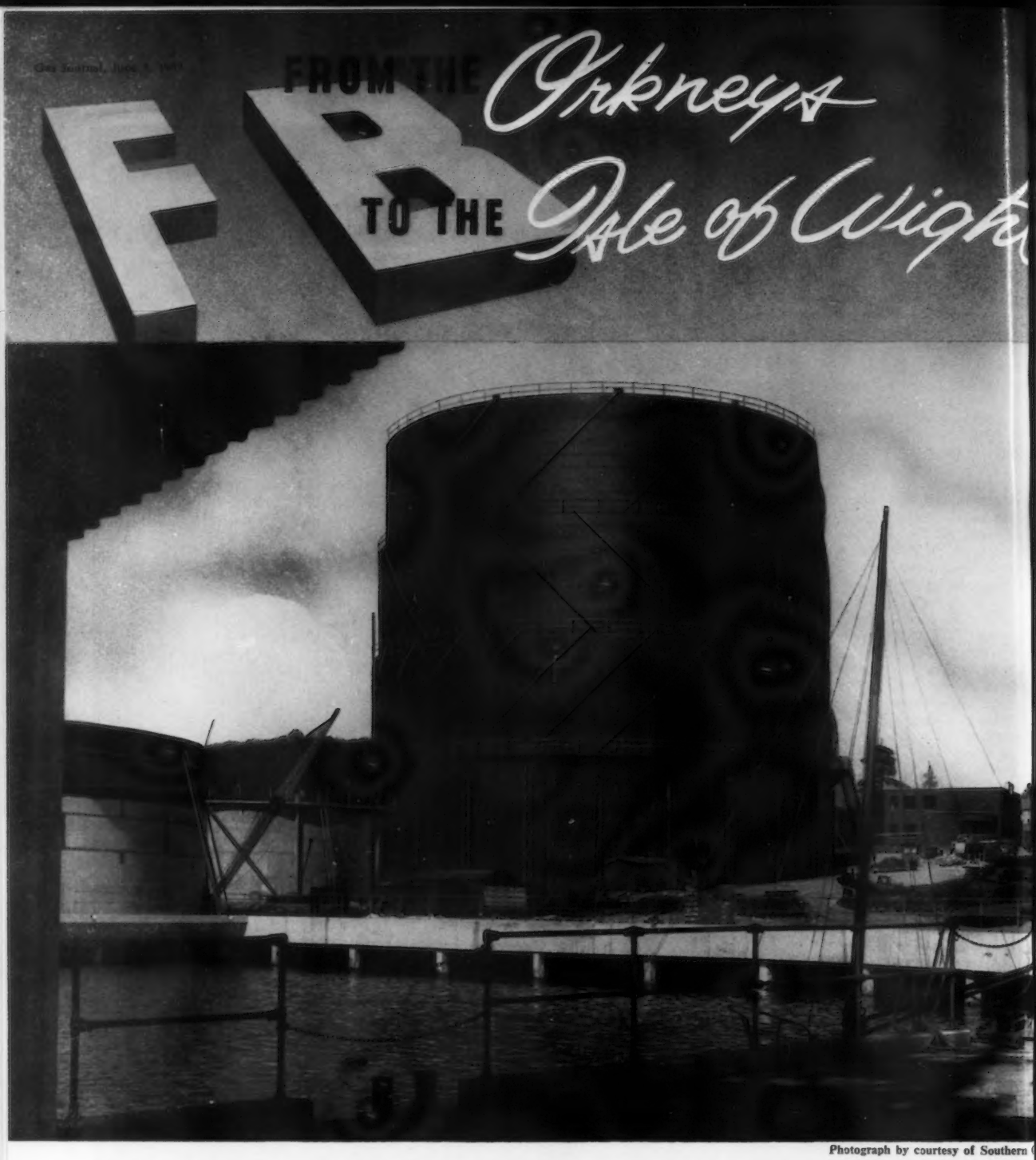

Photograph by courtesy of Southern

New three-lift Spiral-Guided "FB" Gasholder in Steel Tank 1,000,000 cu. ft. capacity, provided with "Vulcan" cup and dip stiffeners, "Vulcan" ball-thrust guide carriages having cast steel bodies and grease gun lubrication. Built for the Southern Gas Board at the New Central Gas Works, East Cowes, I.O.W.

Two further Gasholders are shown in the course erection a double-lift Column-Guided C.W.G. Hold and a 750,000 cu. ft. three-lift Spiral-Guide Holder similar design to the 1,000,000 cu. ft. Holder.

ILLUSTRATED BROCHURE MAILED ON REQUEST

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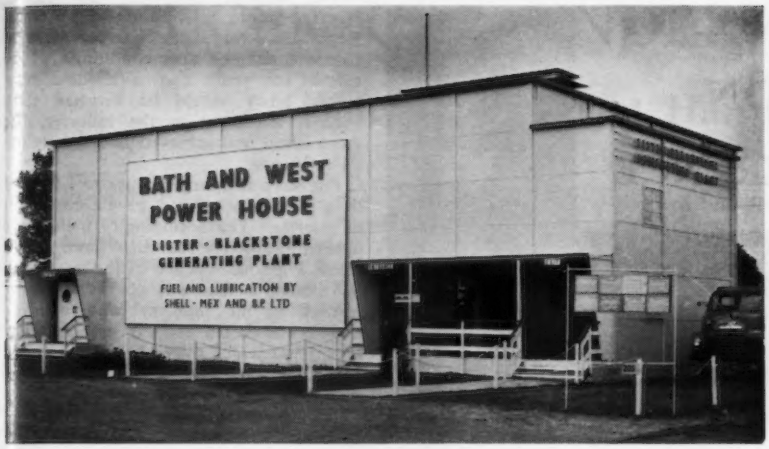


Gas Provides Power at Bath and West Show

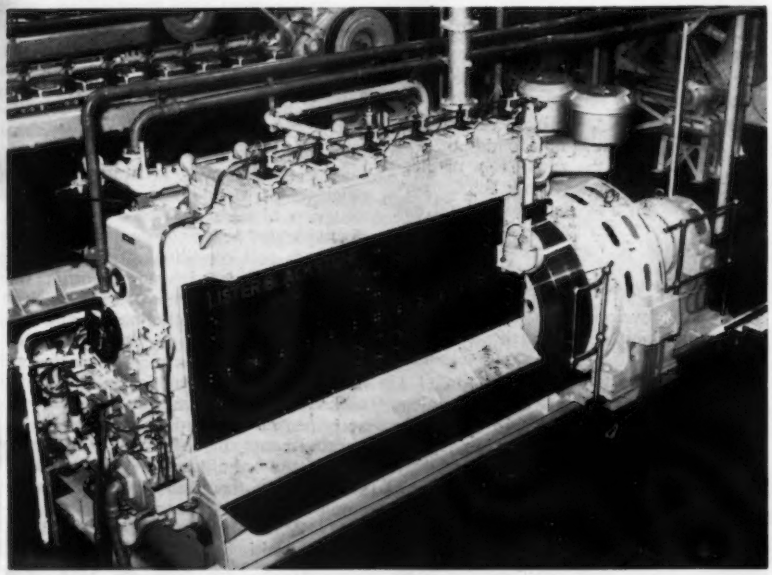
THE Bath and West Agricultural Show is the only undertaking of its kind in the world to have its own independent power house. Each year a prefabricated building is erected in the showgrounds and equipped with a 1,000 kW generating plant to provide all the lighting, cooking and general power requirements. One of the important features of this project is the provision of an adequate supply of hot water for the use of the caterers and in the stock lines. This service is made possible by the inclusion in the plant of a waste heat recovery unit.

As fully reported in our April 3 issue, in addition to two 400 kW alternator sets incorporating Lister-Blackstone ERS8 turbo-charged diesel engines, each with an output of 600 b.h.p. at 750 r.p.m. driving E.C.C. alternators, this year a dual fuel engine-driven alternator completed the plant. Comprising a Lister-Blackstone six-cylinder dual fuel engine, type EVDF6, running at 600 r.p.m. and direct coupled to an E.C.C. single pedestal bearing alternator, this set was connected to the town gas supply. The output from the engine when running on town gas was 220 b.h.p., 150 kW being available from the set, while on diesel oil, the corresponding figures were 270 b.h.p. and 185 kW.

This engine consumed 1 gal. of oil an hour together with gas at a calorific value of 470 B.Th.U. per cu.ft. The gas consumed made up the difference in the fuel needed by the engine when running on different loads. The calorific value of the oil used was 19,000 B.Th.U. per lb. with a specific gravity of .78, so that 1 gal. of oil had a calorific value of about 1.48 therms. The fuel consumption by the engine decreases as the engine running rate increases. For instance, at a running rate of 100 kilowatt hours the fuel consumption of oil is .01 gal. and gas .119 therms respectively, or .134 therms of total fuel consumed, while at an output of 150 kilowatt hours, the fuel consumption has fallen to .0068 gal. of oil and .096 therms of gas, a total fuel consumption of .053 therms. The price of oil and gas supplied for power purposes varies but taking gas at 12d. per therm and oil at 15d. per therm, the running costs may be calculated at these two outputs. At 100 kWh output the cost of gas per kWh is 1.42d. and the cost of oil .15d. per kWh, making a total of 1.57d. per kWh. At 150 kWh output the corresponding costs of gas and oil will be 1.00d. and .12d. per kWh, or a total of 1.12d. per kWh.

When the engine is running on diesel oil only, it consumes 101 lb. of oil per hour or 19.19 therms of oil, and because of the higher calorific value of the oil over the gas, is capable of much higher electrical outputs than when running as a mixed fuel engine. To enable a greater output to be obtained from this engine when running on mixed fuel, it is proposed to instal a turbo supercharger on the air-gas supply. This type of supercharger is already being fitted to the Lister-Blackstone eight-cylinder diesel engine.

The installation was housed in a building 65 ft. long, 47 ft. wide, and with a maximum height of 35 ft. A gallery was provided to enable visitors to inspect the plant. During the course of each show some 40,000 people usually take advantage of these facilities. First visitors when the show opened on May 29 were chairmen, deputy chairmen, and senior officers of several gas boards who had been invited by R. A. Lister & Co., Ltd., and Blackstone & Co., Ltd. to view the installation. Most of them also visited the South Western Gas Board's fine exhibit which combined domestic and agricultural equipment in an attractive setting.



A view of the Lister-Blackstone dual fuel engine.

No Freedom for Them

An amendment that the Housing Committee should allow tenants of future housing schemes to have the choice of gas or electric cookers was lost at a meeting of the Wellington, Salop, Rural Council recently. It had been resolved by the Committee that an electric cooker be held in stock for tenants.

Colour Photography

An exhibition of colour photographs of British industry by Adolf Morath, sponsored by the *Manchester Guardian*, was opened in the North Western Gas Board's Industrial Gas Development Centre in Manchester last month by Dr. B. V. Bowden, Principal of the Manchester College of Technology and Dean of the Faculty of Technology in the University of Manchester.

BRITISH GAS STAFF ASSOCIATION ANNUAL CONFERENCE

Left to right: Mr. C. C. Holt, Deputy President; Mr. W. E. Webb, President; and Mr. T. Mervyn Jones, Chairman, Wales Gas Board.

THE annual conference of the British Gas Staff Association, held last month at Llandudno, was attended by more than 300 delegates, with the Association's President, Mr. W. E. Webb, J.P., in the Chair. They were welcomed by the Chairman of the Llandudno Urban District Council, Councillor C. R. Payne, J.P., who later entertained them at a civic reception, at which the highlight was some beautiful singing by a choir of Welsh girls.

In his address, the President said their thanks were due to the National Council for the part they played and to the national joint staff side for the successful outcome of negotiations which resulted in increases in the national salary scales.

The Gas Council and the area boards had made gallant attempts to hold down prices. Gas Staffs would be aware of the impact on the gas industry of increased costs.

No Repercussions

Industrial strife in other fields had found no repercussions in the gas industry, largely because of the effectiveness of the national and area machinery for joint negotiations and through the facilities afforded by the system of joint consultation. The gas industry was a 'shining example' of harmonious industrial relations.

Ex-company pensioners would derive much satisfaction from the new additions to pensions No. 2 scheme.

Referring to joint consultation, the President said some Consultative Committees were working well, others were in process of development, while yet others appeared to be lukewarm in their approach. It seemed that there was need for further education of some managements and staffs.

The B.G.S.A. policy of ultimate staff status for all intermediate grades remained unchanged but there was a hard core of opinion in some quarters that this method of grading often fulfilled a local need. Area joint councils should give close attention to this problem in their areas.

Area boards had treated the problem of redundancy sympathetically and shown commendable readiness to consult with their organisers in difficult cases.

Voluntary officers serving on the area councils and in the branches had shown a keen sense of responsibility and had maintained high standards.

In conclusion the President paid tribute to Mr. W. A. Coleman, a pioneer for gas staffs, a founder member and the holder of numerous offices, who was retiring; to Mr. C. C. Holt, Vice-President, and the members of the National Council; to the General Secretary, Mr. F. C. Henfrey-Smith; to the National Organiser, Mr. H. J. Arnold; and to Mr. T. R. Robson, Financial Officer.

Major Instrument

Addressing the Conference, Mr. Mervyn Jones, Chairman, Wales Gas Board, said the gas industry was a major instrument of a sound national power policy, as it made the best use of coal in producing gas and smokeless solid fuel and providing raw material for the expanding chemical industry. It also saved millions of tons of coal by using surplus gas from the steel industry's coke ovens and oil from the refineries.

It was a popular misconception that the heat generated in an atomic pile was only relevant to the production of electricity. There appeared to be no permanent reason why that heat would not soon be used to carbonise coal, crack oil, or otherwise perform gas making processes.

The gas industry had faced up to revolutionary developments. A technical revolution inevitably brought a human one and the Association must consider how best to meet the challenge.

No one liked to change their job unless they chose to do so. But to shut their eyes to inevitable change was impossible, and would be a betrayal of their duty to those they sought to serve. Along that route lay the death of the industry and so the livelihood of *all* its employees. Redundancy would be total and complete. To fail to accept change was to face death.

The General Secretary, Mr. F. C. Henfrey-Smith, introducing the Annual Report, said that if the members were to compare salaries and conditions which existed ten years ago with those now current they would be satisfied that, without detriment to the industry, the Association had achieved fine results for its members.

But there was larger issues to be faced than the maintenance or improvement of salaries. The beginning of the atomic age had caused a fear that there would result a gradual decline of the gas industry. Such a fear was not held by the leaders of the industry who believed that it was on the verge of a most exciting period which might be another turning point in the road to even greater service to the community.

The Financial Statement was presented by the Financial Officer, Mr. T. R. Robson. The Conference rejected a motion by the National Council to increase subscriptions from 3s. 6d. to 4s. a month.

The Conference called for a national fuel policy to ensure that each form of fuel should be used for the purposes for which it was best suited, and expressed concern at the peril to the country's economy of industry's reliance on imported oil. It urged the Government to reduce the 20% initial payment on H.P. terms for domestic cookers and regretted that purchase tax was still imposed on gas-operated heaters while similar oil-fired heaters were untaxed.

Transfer Scheme

The Association should establish that all matters concerning pensions were subject to joint negotiation between the employers and the trade unions, and the National Council should investigate and negotiate a scheme whereby a redundant employee might be able to transfer his whole credit in a gas pension scheme to a scheme operated by his new employer or to an approved insurance scheme.

On salaries, the Conference, despite a vigorous defence from the platform, said that the last salary award was unsatisfactory and failed to maintain differentials. It instructed the National Council to re-open negotiations to obtain a further, back-dated increase.

The Conference also said the Association, while fully prepared to co-operate in the mutual task of improving the efficiency of the industry, should demand that part of the results of increased productivity be reflected in better salary standards and conditions of service.

On a small card vote majority, the National Council was instructed to have the special scales eliminated and all female staff graded in the clerical or A.P.T. scales; it was also instructed to secure an improvement in staff overtime bonus, the extension of the overtime agreement, a standard 38-hour week, and improvements in holidays. It again urged the abolition of intermediate grading by the transfer of all such employees to staff status.

Mr. W. E. Webb was re-elected President, a position he has held since 1946, and Mr. C. C. Holt of York was re-elected Deputy President.

PRODUCER GAS UNDER DISCUSSION

Conference Held at Harrogate

PRODUCER gas manufacture and utilisation was discussed in Harrogate on April 16 and 17, under the organisation of the British Coal Utilisation Research Association by 140 delegates, of whom some 60 came from the heavy industries and represented users of producer gas plant, and the remainder from plant manufacturers and various research institutions, including, of course, B.C.U.R.A., itself. Indeed, the scientific staff from Leatherhead were the backbone of the conference, supplying factural information wherever it was needed.

Since the industrial producer was the main object of this conference, nothing very revolutionary in design was considered. The gasification of powdered coal in vortex chambers was barely mentioned, and fluidised bed processes did not come into consideration at all. The focus of attention was the independent, cylindrical gas producer, usually fitted with mechanical ash removal. Hot uncleaned gases are led from this to the glass melting tank or the open-hearth furnaces and the tar which the gas contains adds about 45 B.Th.U. per cu.ft. to the calorific value and imparts radiating properties to the flame. However, even in the restricted field of the simple static bed non-slagging producer, there was plenty to be discussed, and interest did not flag throughout the two days of conference.

Will Become More Important

Although this subject might appear at first sight to be not very relevant to the gas industry, the gasification of coal seems likely to become much more important to us all in the near future. If increased supplies of solid smokeless fuel are to be made available, the use of high grade coke for gas manufacture will become increasingly unattractive. Producers for the gasification of either coal or coke breeze will be brought more and more into use. As M. Gagnaire, of the French delegation, indicated, the gasworks at Rouen is already gasifying coal in two-stage producers; the 'bottom gas' (similar to coke producer gas) is used for firing the coke ovens, and the 'top gas' is added to the coal gas make.

The manufacture of gas, even by the producer process, is a complex and specialised business. It is difficult to believe that the operation of a separate gas-making plant at each works is the most economic arrangement that can be devised, even though it may show definite financial advantages over an ordinary supply of town gas. Would not the bulk supply of producer gas be a practicable possibility on the modern factory estate? The low calorific value of the gas makes long-distance transmission inappropriate, but local units in areas where heavy industry is congregated should be able to make gas at a price per therm which would compete with the private producer and save a good deal of worry and trouble to individual firms.

At the outset, the conference was faced with the problem of coal quality, and the subject recurred time and again. J. J. Whiteheart (Pilkington Bros.) complained that the supply of 'doubles' of low swelling number which producers need, was now difficult to obtain. A high percentage of fines in the coal made producer operation much more difficult than in the past. The fuel bed became less permeable, and this led to an excessive flow of air close to the walls, so that 'flaring' took place round the periphery of the bed.

Mechanical methods of coal winning always tend to lead to a smaller proportion of large coal, and it may well be that plant designers will have to reckon with the fact that large coal of suitable quality may not be available.

The coal used must clearly be of the non-caking kind, otherwise the fuel bed would coalesce into an impenetrable mass. Experience shows that a coal having numbers 1 to 2 on the B.S. swelling test gives the best results, but it seems that coals lying outside this range may sometimes be used successfully. The B.S. test is made on coal which has been ground to pass through a 72 mesh, and the behaviour of lumps 1 in. to 2 in. in size may be rather different. Prof. Sarjant suggested an empirical test on a 4-lb. sample of coal, taken just as it would be used and heated in a refractory pot at the temperature of a producer bed.

Some producers operate on coke, and D. J. Borgars (I.C.I., Billingham) made a trenchant attack on irresponsible coke suppliers who sell coke containing 15 to 20% of water. 'A very convenient way of selling water at a good profit,' he commented. Considerable economies in gas production could be made simply by keeping a sharp eye on the moisture content of the coke.

The price structure of coal, says Mr. Borgars, is broadly based on c.v., but no such principle enters into the coke market. Coke prices take no account of the ash content, and as fuel costs can represent 80 to 90% of the total costs of operating a producer, it is clear that substantial economies can be made simply by choosing a low ash coke.

It has become clear in recent years that it is advantageous to keep the outlet gas temperature in the range of 500° to 600°C. Higher temperatures than this carry a double penalty—the c.v. of the gas produced is lower, and at the same time, the tar produced has a higher percentage of pitch. The pitch tends to obstruct the foul gas mains and to make it more difficult to burn the tar in the furnace.

To achieve this outlet temperature a relatively deep fuel bed is necessary which presents difficulties if a good graded fuel is not available. It is all-important that the air shall be evenly distributed across the fuel bed, and most of the techniques of controlling the operation of a producer are designed to this end. Cavities in the bed which would cause points of low resistance are prevented by poking, and the loading arrangements must be such that an even top to the bed is secured.

In spite of all the care taken, the walls of the chamber tend to offer an easy path in comparison with the middle of the fuel bed. Recently fresh attempts have been made to reduce the flow at the periphery by fitting a steam pipe round the walls in the ash zone, at the base. This has the effect of displacing air and so it prevents oxygen getting to the top of the bed and burning up some of the gas. Although the tests being made by Pilkington Bros. have given very encouraging results, deterioration of the tube in these highly corrosive conditions is still a major problem.

Large Amounts of Nitrogen

Ordinary producer gas generation necessarily implies the propulsion of large amounts of nitrogen through the fuel. This absorbs heat, lowers the c.v. and again takes away heat in the flue gases from the furnace. G. Husson, from France, described attempts which had been made to enrich the air with oxygen; this was an established procedure at Longwy and several other places. If slagging was to be avoided 29% O_2 in air seemed to be the maximum that could be used, and 25% or 27% was preferable. Even this relatively small degree of enrichment produced tangible benefits—13% increase in c.v., 9% increase in productivity, 7.6% decrease in coal consumption.

One session was devoted to instrumentation and automatic control, but nothing very sensational developed. The usual method of controlling coal feed automatically is by the temperature of the gas offtake and the pressure in the gas main. Ash removal is usually controlled manually, but one of the smaller industrial producers now on the market has a thermocouple built into the 'mushroom' of the grate. Too low a temperature at this point indicates need for a greater rate of ash removal; too high a temperature indicates that the ash layer is too thin, and the removal mechanism is halted.

It has been long accepted that the radiating power, and hence the usefulness, of the producer-gas flame is due to the presence of tar. Unfortunately, the pre-heating of the gas tends to destroy the tar: Either it is turned to soot or, in the presence of steam, it decomposes into gaseous products. Pre-heating at 900° to 1,200°C. has been shown by Mr. D. Gill (B.C.U.R.A.) to have this effect and, at the same time, ethane diminishes and methane tends to increase.

What effect does all this have on the usefulness of the flame? The elimination of tar and the heavier hydrocarbons together with the increase in the amount of water-gas, clearly reduces the radiating power of the flame, and may, to some extent, offset the advantages of pre-heating. The importance of a high radiation component in the flame has been regarded as axiomatic, but, Prof. Sarjant cast some doubt upon its validity. If, he said, one plots a graph showing heat input against heat output for a large number of different furnaces using different fuels and of different types of construction, one obtains a series of points which lie not, it is true, on a straight line but on a relatively narrow belt. Perhaps therefore the radiating power of the flame is not so important after all.

This consideration might have given rise to some doubts among Prof. Sarjant's hearers for if taken too literally it would seem to suggest that all furnaces have the same efficiency, regardless of the care taken in their construction and operation. Clearly what happens within the width of the bend is a very important part of the diagram, and one cannot help thinking that it is these variations which are all-important.

Another direction in which producer gas operation may develop is towards increasing pressures. There seems no doubt that in this respect oil burners have a decided advantage, for the high-pressure flames which they provide can be more properly directed to where the heat is most required. Mr. S. Senior (Stewarts & Lloyds) described a new producer-gas fired furnace working at a pressure of 4-in. w.g.

Difficulties Experienced

At this increased pressure a much higher velocity of flame could be produced. While this had definite advantages in the furnace, some difficulties were experienced both in the air checkers and in the gas main, for it was found that dampers quickly fouled, he explained. The latter problem had been solved, however, quite satisfactorily by using steam cooling. From time to time jets of steam were used to blow off carbon deposits and it was possible to run the plant for 14 days at a time. After this it was necessary to burn off the deposit on the inside of the gas main.

The traditional method of operating a producer involves a periodic shut-down in order that air may be blown through the gas main to burn off the deposit of pitch and tar on the inside. This, of course, produces a great deal of smoke and, although some socially conscious operators have already taken steps to reduce the nuisance, it seems that such steps will become compulsory when the Clean Air Act comes into force.

One practical method of dealing with this problem is to use a cyclone type dust extractor and Mr. Harper (Steel Peech & Tozer) described work done in conjunction with B.C.U.R.A. on the development of an efficient dust trap. Flow patterns inside the earlier model had been studied and it was found that a good deal of the dust which had been removed from the gas in one part of the apparatus was substantially re-entrained. One of the immediate improvements made was a modification in design which removed the collected dust away from the high velocity gas stream. As now developed, the device removed 95% of the dust with a pressure drop of only ½ in. w.g.

At the glass works of Pilkington Bros. a different solution has been found. In this case a special combustion box has been built containing checker brickwork which can be heated to 1,000°C. by an oil burner. Once this temperature has been reached air from the gas main, laden with tarry and sooty particles, can be blown through the checker brickwork and the issuing gas is almost clear of carbon. Before this apparatus was installed, one might have found smoke of Ringlemann 5 issuing from the stack for 2 to 4 hours when burning off was being carried out.

Two notes on the cost of producer gas were submitted to the conference: One from Mr. G. O. Bass (The Power-Gas Corporation) and the other from Mr. A. H. O. Johnson (International Furnace Equipment Co., Ltd.). Mr. Bass, whose paper was read by Mr. T. H. Riley, dealt with coke and coal, but Mr. Johnson confined his attention entirely to coal. The figures for the total cost which both these authors arrived at were very similar and ranged from a minimum of 4.8d. per therm (using coke breeze) to a maximum of 7.8d. per therm (using small coke). The various qualities of coal all fell between these figures.

If one compares the cost of supplying hot, tarry gas with the cost of clean gas, it becomes evident that the former is much the more economical. For comparable cases, Mr. Johnson finds the cost per therm to be 6d. and 7.6d. per therm respectively. This calculation allows for a credit due to the tar, based on the price of 3d. per gal. If one combines this fact with the claim of a greater radiating power in gas from the tar-laden flame it becomes evident that the case for using hot gas is strong. Against this, however, must be set the difficulties of supplying hot, tarry gas over relatively long distances, and any greater wear on the refractories of the furnace which may arise from the presence of dust.

An analysis of the percentage costs shows that fuel is much the most important of all the charges. If good coal is used, it may be as high as 88%; with coke breeze, it can be as low as 50%; but in the latter case, the capital cost is higher. With poor coal the proportion is 57%.

It is perhaps worth mentioning that both these estimates were prepared by manufacturers of producer gas plant. The Chairman of the session, who represented a user rather than a manufacturer, complained a little sadly of the discrepancies which seemed to exist between the estimates of costs on the two sides of the counter. Unfortunately, in spite of his appeal, none of the large users of producer gas present came forward to give his version of the cost situation. Mr. Borgars (I.C.I., Billingham), however, contributed some interesting data which included a heat balance.

Since the cost of fuel bulks so large, and since the grading of the coal or coke has a big effect on the ease and efficiency of operation, some attention was rightly given to the methods of handling the fuel mechanically. Most methods of automatic feeding by belt or bucket conveyors involve a fall at some stage in the process, as for instance, when the solid is deposited into the feed hopper. It is at this stage that breakage occurs and the fuel is degraded to a smaller size.

Dr. R. Jackson (B.C.U.R.A.), described some experiments which they had made on the breakage of coal during mechanical handling. One could, by a sieving process, analyse the fuel at any one stage into the percentage at different sizes. By repeating this process along a conveyor line, one could find the percentage of coal which was damaged at each stage. In one particular case it was investigated by B.C.U.R.A. The percentage of the original coal which was reduced in size amounted to 5 or 6% at each point where the coal was transferred from one belt to another, but the final descent into the feed hopper produced a much more serious change. In this last stage of the process 36% of the total mass was degraded, and this quite serious loss would have been almost eliminated were a spiral chute fitted above the hopper.

'Save a Life'

CARBON monoxide poisoning—'the major hazard of our industry'—was referred to in a talk entitled 'Save a Life,' given to the East of Scotland Junior Gas Association by Dr. D. G. Waddell at Falkirk recently. He made this reference, he said, for several reasons:

'Far too frequently I hear of cases where adequate protection has been ignored wilfully or otherwise. The practice of working in the presence of live gas without adequate protection is roundly condemned—it is dangerous, foolish and suicidal. Adequate protection is available in the shape of the Antipoys fresh air breathing apparatus and, under special circumstances, the self-contained oxygen or compressed air apparatus.

'I would like to refer to the B.M.A. recommendations on CO poisoning recently published in the technical press. I criticise this report on the grounds that by implication it infers that it is safe to work in CO for short spells. It also mentions canister respirators—these are definitely not safe as too great a reliance has to be placed on the activity of the catalyst.'

Dr. Waddell then referred to the 'still too frequently used method of marching the CO victim up and down. This practice is highly dangerous,' he said. 'The cause of symptoms in CO poisoning is the lack of oxygen available to the tissues due to the combination of the CO with the blood hæmoglobin. Exercising the patient merely creates an increased demand for the already depleted oxygen with the inevitable worsening of the patient. The correct treatment is absolute rest, keep the casualty warm and give oxygen if and when available.

Presented to the Irish Gas Association at Wexford, May 8, 1957.

Efficiency and Economics of Coal Carbonisation

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IN Great Britain the view is sometimes expressed that the gas industry might do better as a one fuel rather than a two fuel industry and we hope therefore to set out the efficiency and potentialities of coal carbonisation, so that the very fact that there is a shortage of coal would appear to justify an increase in carbonisation to get the most out of our inherent resources.

Since the first days of gas there have been constant endeavours to improve methods of manufacture and to obtain greater efficiency from each item of plant. Considerable success has been achieved in this respect with the result that carbonisation is far and away the most efficient method of processing coal. A thermal efficiency of 80 to 85% is readily obtainable from a modern carbonising plant, and, in fact, from a study of the Ministry of Fuel and Power Statistical Digest, 1955, it can be calculated that the gas industry, as a whole, had a thermal efficiency in excess of 76% against 20 to 25% for all other coal users.

Big Strides Made

There has been an increase in the make of gas per ton of coal from 15,800 cu.ft. in 1921 to 18,700 cu.ft. in 1955, while the coke yield has increased from 13.06 cwt. per ton to 13.48 cwt. Although this is not wholly a measure of increased carbonising efficiency as water gas and changes in calorific value have both played their part, it shows nevertheless that the gas industry has made big strides in using coal to good advantage.

Figures for the year ending March 31, 1956, show that comparing 1921 with 1955/56, whereas coal consumption and coke made is up by approximately 76%, gas available is up by as much as 141%, coke used for water gas manufacture is up by 11%, and oil usage is up by 156%, coke oven gas has increased from 0.5% to 14.2% of total gas available for sale and has thus become a very important factor.

The fact that 48% of all gas made (thermal basis) is produced in continuous vertical retorts proves that the gas industry is playing its part in the matter of coal conservation by modernising its plants and adopting the latest developments. Obviously if improvements of this kind were achieved by only a fraction of other users there would soon be a vast improvement in the fuel position. Consequently it would appear to be reasonable to restrict coal supplies to the less efficient users and encourage the gas industry to carbonise more and more.

The continuous vertical retort was introduced about 50 years ago and two systems now share about 95% of the market. The early vertical retorts were built in fireclay but a silica belt was introduced in 1918 or thereabouts to enable greater throughputs to be achieved and units are now available to deal with anything from three to 12 tons coal per day. The direction of heating has changed with the times and today upward heating in horizontal flues is usual. Having the hottest zone near the bottom facilitates the production of water gas by steaming and also assists in handling the more highly swelling coals. Modern continuous vertical retorts are capable of dealing satisfactorily with practically any type of coal although best outputs are obtained from medium swelling Yorkshire and Midland nuts. Such highly swelling types as Durham run-of-mine work however quite successfully although at slightly lower throughputs. Scottish coals, which have the opposite properties as regards swelling to those from Durham, have always been used with great success and can be worked at higher coal throughputs than others. There is a wide choice of calorific value as practically all coals can be steamed to some extent.

Recuperators, which were considered necessary a few years ago, have been eliminated so that the space formerly occupied by them is now available for gas-making with a resulting higher output per unit of ground area. Present day non-recuperative installations have a very low fuel consumption due to a compact design and preheating of secondary air by heat from the bottom castings and the descending coke charge. Waste heat boilers are almost invariably included with modern plants and raise approximately 9,000 lb. steam per ton of fuel used in the producers. There is a minimum of arduous work for the operatives and modern methods of dust prevention make the plants extremely clean. The first of the modern intermittent vertical chamber installations was built in Great Britain in 1926, although intermittent vertical retorts were built much earlier. Units are available to hold from 1 ton to 4 tons per charge, and account for 8% of gas made.

The fuel consumption is adversely affected by the fact that red-hot coke is discharged and its sensible heat thereby lost to the system. Consequently recuperators are provided to preheat the secondary air which means a reduction of waste heat boiler steam to about 5,000 lb. per ton of fuel. It is desirable to use coals with a swelling number of at least 3 so that a coherent coke can be produced and to discard any which are capable of setting up unduly high pressures which might damage the chamber walls. Apart from these limitations, intermittent vertical chambers will handle any coal to give high therms per ton of straight gas which can be steamed to almost any calorific value. Prolonged steaming however adversely affects the life of the chambers, as ash liberated during the steaming period causes erosion of the bottom silica. Therefore most chamber plants are worked at high calorific values with dilution from external sources to obtain the desired final calorific value.

Changed Design

Horizontal retorts have been in use since the earliest days of gas-making, although modern plants are very different from the originals. As they can be built in small units and are simple to operate they are eminently suitable for small works and still provide 23% of all gas made. The early settings were direct fired, with perhaps five stop-ended fireclay retorts, carbonising about 10 cwt. per day each, whereas today there are 'through' silica or siliceous retorts or ovens in recuperative setting of tens or so, each capable of carbonising 40 cwt. or more per day.

Mechanical charging has been adopted in place of hand or scoop charging and dry ascension pipes have given way to scrubber stand pipes so that there is virtually no 'pipe jumping.' The production of naphthalene has been reduced by the use of heavier coal charges, by paying more attention to hydraulic mains and by the adoption of retort house governors. They will deal with any kind of coal, although a swelling number of 3 or more is desirable to obtain a coke

HANDLING PLANT
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of sufficient strength to withstand pushing. Straight gas of a high calorific value is made because efficient steaming is not possible and the high calorific value must be adjusted by the use of some external diluent. Their adoption today is unusual due to the somewhat hot and dirty conditions usually associated with them and the greater manpower required.

Developments have been made in coke oven design and construction in the past 25 years and new batteries have been and are being erected in many parts of Great Britain to replace or supplement the older less efficient types, and to meet increased demands for steel production. As these are mostly 'combination ovens' they can be fired either by coke oven, blast furnace or producer gas and are, therefore, potential producers of town gas as well as additional coke. Coke ovens at gasworks supply 4% of gas made.

Present day ovens are of silica construction and fully regenerative so that they do not produce waste heat steam. As a rule they are about 40 ft. long and vary in width from about 15 in. to 18 in. and are each capable of carbonising something like 20 tons of coal per day. Coke oven plants can only be economical if adopted on a large scale, although on capital cost alone, a plant of about 600 tons per day capacity compares favourably with other types. If, however, all oven machinery is to be employed most economically, the size of unit would be well beyond the capacity of the ordinary gasworks, particularly as the daily gas output per unit area is on the low side, being rather under 1½ therms per sq. ft. as against 3½ therms per sq. ft. for a large installation of continuous vertical retorts.

Coke Oven Coal Needs

Coke ovens are somewhat selective as regards coal and they must carbonise varieties which produce coke that is sufficiently strong to withstand the pushing operations and do not set up unduly high pressures. Double collecting mains and charging 'on the main' are methods of reducing atmospheric pollution during the charging operation but despite such ameliorations, the installation of coke ovens in a built-up or residential area is not desirable.

Carburetted and blue water gas provided 12.6% of gas available for sale in Great Britain in 1955-56 so that the process is obviously a well established method of production. When it was introduced into England in 1890, it was used to enrich coal gas to the then prevailing high standard of illuminating power, but it is now extensively used by most medium and large undertakings to dilute coal gas, to meet peak loads and to assist in controlling the coke market. The ease with which the quantity of oil and hence the calorific value can be varied makes it exceedingly flexible. Modern plants are mechanically charged and clinkered and all operations are carried out automatically. Waste heat boilers are usually provided together with water jacketed generators, while the back-run process of operation is standard. The advent of the Clean Air Act in Great Britain will undoubtedly stimulate domestic coke sales and reduce the quantity used for gas production.

Until recent years, gasworks carbonising plants have always been heated by hot gas made in step grate or similar hand-fired producers. In horizontal plants such producers have generally been fed with hot run-of-retort coke direct from the retorts whereas vertical retorts and chambers have used cold coke—either graded, run-of-retort or a mixture (sometimes with added breeze).

The practical heating of vertical retort settings by hand-fired producers of correct design has always been satisfactory and operating and maintenance costs have always been low, but where coke with much ash and a low fusing temperature is used, firecleaning is an arduous job and consequently a number of recently built plants have been equipped with mechanical producers. Such mechanical producers certainly improve working conditions as they discharge cold ashes automatically and can also be charged automatically. In addition they eliminate fluctuations in calorific value and temperature of producer gas, reduce the carbon content of the ashes and the quantity of dust carried forward into the settings and are also capable of dealing with high ash fuels without extra labour.

Coke, either run-of-retort or sized, remains the basic fuel for producer gas production. Breeze is not generally acceptable because it can only be gasified at a low rate and therefore calls for additional producer area, requires more steam, gives a higher carbon loss in the pan ash and, in the case of hand-fired types, calls for more labour. Great efforts have been made in recent years to reduce the amount of fuel used to heat the settings and thereby release more coke and breeze for sale. Every opportunity is taken to minimise heat losses so that modern settings are now worked with the lowest ever fuel consumption.

Non-recuperative continuous vertical retorts have been found to give the lowest net fuel consumption when steam from the W.H. boiler is taken into account. Strangely enough this applies even when compared with continuous vertical retort installations with recuperators. The fact that the non-recuperative setting is more efficient thermally does not necessarily mean that it is more economical than the recuperative, as the economics depend on relative coke and breeze (if used on the works boiler) values and total capital costs of carbonising plant and works boilers.

Quite apart from the good thermal efficiency the adoption of the non-recuperative design has the following advantages: (a) The space formerly occupied by four recuperative retorts can accommodate six non-recuperative retorts, (b) recuperator stresses and possible leakage caused by lighting-up and shutting-down of retorts for seasonal demand or other reasons is eliminated, (c) thermal losses are reduced to a minimum as the non-recuperative setting is compact in design, (d) for a given gas output the capital cost of recuperative continuous vertical retorts is 20-30% higher than that of non-recuperative, (e) costly materials having a low thermal conductivity must be used in recuperators as they are most suited to withstand the heavy duty imposed by the differential temperatures. More reasonably priced materials of high conductivity are unsuited physically to withstand these conditions.

An important but incalculable factor in the cost of gas and coke production is 'technical supervision.' The cost of retort house labour itself, despite wage increases, is not a very serious item in the final cost of gas but indifferent or stinted technical supervision in the retort house does have a profound influence; the aphorism that 'profits are earned in the retort house' is only true if the retort house is worked efficiently and therefore retort house supervision should always be the best obtainable. It has been stated that it is possible to obtain a thermal recovery of 80 to 85% from modern carbonising plants but this presupposes well controlled operation and if this is lacking the efficiency will assuredly drop.

A technical supervisor on a works of only 250 mill. cu.ft. per year, carbonising coal costing £7 per ton, would be worth an additional £1,250 per annum if he could increase the gas yield by 1 therm per ton or increase the coke for sale by 0.2 cwt. per ton, i.e., reduce the fuel consumption from say 15% to 14%.

Losses of Gas

It is very easy to lose one gaseous therm per ton through overpulling, retort leakage, leaking bottom ironwork with air in-leakage and consequent combustion or poor carbonising temperatures with resulting high volatile therms in the coke discharged. Overpulling is one of the main causes of loss in therms per ton because it reduces the range of steaming.

Generally speaking, 3% of added air is sufficient for purification and, if 4% is added, a calorific value approximately 4 B.Th.U. higher must be made in the retorts. This represents a loss of about 1 therm per ton at a C.V. of 500 B.Th.U. or 2 therms per ton at 450 B.Th.U.

Lack of attention to the producers can also result in serious inefficiency as apart from heavy clinker formation and possible increased labour, the producer gas deteriorates in quality and temperature and there is a greater loss of carbon in the pan ash with a consequent increase in the fuel consumption.

A reasonable calorific value of producer gas is 120-125 B.Th.U. per cu.ft. and a drop of 4 B.Th.U. due to over-steaming or other causes will increase the fuel consumption by 5%, i.e., from 15% to 15.75%.

In a step-grate producer a good target figure for carbon in dry pan ash is 25%. If, due to bad supervision, the carbon content of the dry clinker increases to 40% the gross fuel consumption will increase by 3½%.

It is important to minimise sensible heat losses in the producer gas and it has been shown that if the secondary air temperature is 400°C. and the producer gas is 800°C. the

fuel figure is 100 units; when the producer gas temperature falls to 700°C., the fuel figure increases to 105 units. The actual combustion chamber conditions are extremely important and if the waste gases leave the combustion chambers at a temperature 50°C. higher than is necessary the fuel consumption will increase by 5%.

It is desirable to keep the secondary or combustion air down to a figure as near to theoretical as possible. With perfect combustion the CO_2 content of the waste gases in the combustion chambers would be about 20.5%, but this would inevitably mean unburned CO going forward into the waste gas flues to create dangerous conditions. Consequently we suggest that a good target figure is 18% CO_2 in the gases leaving the combustion chambers. The effect of further excess air which lowers the CO_2 content of waste gases has a very marked effect.

If on a non-recuperative setting, where the combustion air is at a temperature about 400°C., the fuel figure is taken as 100 units with 18% CO_2, then should the CO_2 fall to 17% or 16%, the fuel increases to 107 and 115 units respectively. On a recuperative setting where the air temperature may be as high as 800°C. the fuel increase, under similar CO_2 conditions, would be to 105 and 112 units respectively.

After the waste gases leave the combustion chambers they pass through flues to a waste heat boiler and it is important to reduce air infiltration in these flues to a minimum, otherwise cold air is heated up and ultimately ejected from the W.H. boiler at about 250°C. The heat used for this purpose will obviously reduce the steam output. We consider that a good target figure for CO_2 at the W.H. boiler is 15%.

On a non-recuperative setting with 15% CO_2 at the W.H. boiler, a steam output of 100 units is obtainable, but if the CO_2 is allowed to drop to 13.5% the steam output will drop by 5 units to 95.

Instrumentation

Instrumentation is a field in which there have been great developments in order to obtain best possible control for highest efficiency. Practically all modern plants are provided with numerous instruments mounted on centralised panels and there will be various views on the advantages and disadvantages of this arrangement over the more general practice, in earlier days, of having individual gauges fitted at the particular piece of plant being controlled. It is imperative that instruments be regularly checked and serviced, otherwise their value will be jeopardised, for instruments in themselves do not lead to increased efficiency of operation; it is the interpretation of the data collected that leads to efficiency. Technical staff must, therefore, be available for this duty.

In Great Britain the Clean Air Act has caused a great deal of thought to be given to means whereby the quantity of coke available for sale can be increased. This desirable object is no doubt of interest in Eire also and the following schemes may be worth consideration: 1. Increasing the calorific value; 2. diluting by means of producer gas; 3. heating the carbonising plant with coal gas; 4. heating the carbonising plant with bituminous coal.

A considerable increase in coke and breeze for sale can be obtained by raising the calorific value from 450 B.Th.U. to 500 B.Th.U. per cu.ft. For a plant producing 10,000 therms per day there would be an increase in total saleable coke and breeze of 18.5 tons per day or 37.5%. On a larger plant working on base load the effect may be even greater. At 500 B.Th.U. surplus coke is found to be 16 lb. per therm whereas at 450 B.Th.U. it is only 11.7 lb. per therm.

Most carbonising plants have a certain amount of spare grate area which can be made available for extra producer gas generation. The equipment required is relatively simple and consists of a connection from the producer gas stream at some convenient point to the bottom of a scrubber which is sprayed at the top with water or liquor and cooled to about 140°F. The cooled gas then passes through a seal tank into the foul gas stream at a point between the retort house governor and the condensers, where there is usually a suction of about 3 in. w.g.

The increase in saleable coke when producing 500 B.Th.U. gas in the retorts and diluting with producer gas to 450 B.Th.U. as compared with direct steaming to 450 B.Th.U., both in 10,000 therm per day plants, is considerable and amounts to an increase in total saleable coke and breeze of some 30%.

Coal gas for heating purposes can either be used alone or mixed with producer gas. Where the heating flues are arranged horizontally, it is possible to heat the settings with coal gas alone by mixing the gas and air in specially designed burners.

When making 500 B.Th.U. gas, 55,000 cu.ft. are required to replace one ton of dry coke normally gasified in the producers, and would increase the saleable coke by approximately three cwts. per ton and reduce saleable gas by 8,250 cu.ft. per ton.

Partial coal gas firing can be applied to any type of carbonising plant with the gas admitted either into the producer or producer gas main. Up to 40% of the heat requirements can be supplied by this method, but if a higher percentage is attempted flame luminosity occurs and makes it impossible to take flue temperatures by pyrometer.

On entering the producer, the coal gas is heated and the hydrocarbons, being 'cracked,' deposit carbon in the fuel bed. This reaction reduces the calorific value of the admitted gas and destroys its luminosity. Since the reaction is endothermic the fuel bed temperature is lowered. The saleable coke will be increased by approximately 1.2 cwt. per ton and the saleable gas reduced by 3,300 cu.ft. per ton.

The effect on gas and coke production, from a carbonising plant designed to make 10,000 therms of 500 B.Th.U. gas per day, under different methods of heating from 100% coke producer gas to 100% coal gas is to raise the saleable coke per ton from 10.55 cwt. to 13.55 cwt. and reduce the saleable gas from 10,000 therms to 4,700 therms per ton. This can be a very useful method of building up a stock of coke during the summer months and also keeps retorts usefully employed

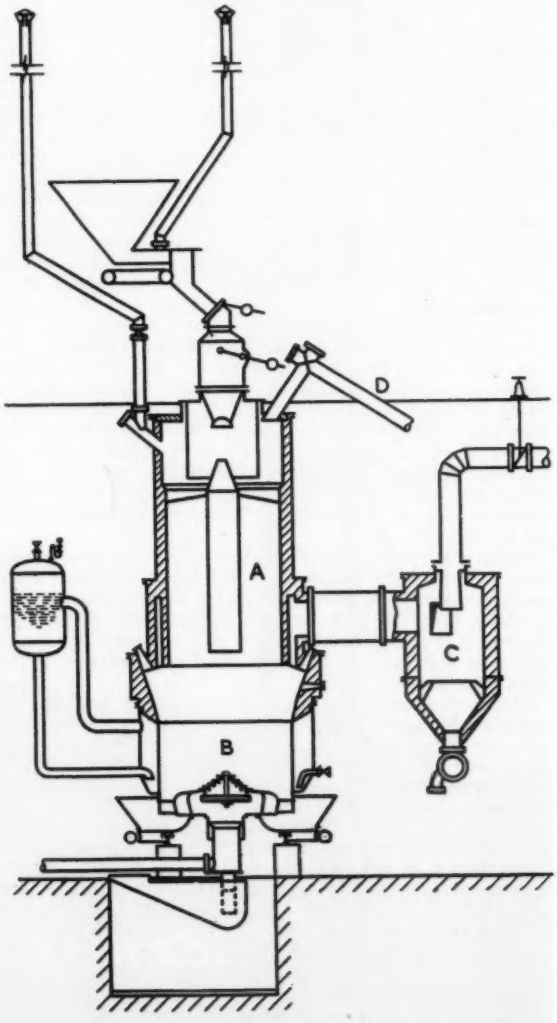


Fig. 1.

which may be merely kept under fire for emergencies or be idle for heating up at peak periods during the winter months.

If, for instance, only 7,870 therms of gas per day were required in the summer the total coke and breeze for sale, when heating with coke, would be 53.1 tons per day. By keeping the plant at full gas output and using the surplus gas for heating, the coke available for sale would be 75.2 tons per day—an increase of 42%.

The G.I. two-stage producer has been designed for the gasification of coal and is very suitable for heating carbonising plant. It will operate successfully on screened coals with swelling numbers of 1 to 3. Fig. 1 shows a cross-section of this producer which comprises a distillation chamber or retort (A) superimposed on a mechanical producer (B) which is steam/air blown.

Hot gas at about 500°C. is generated in the producer approximately half of which is taken off and passed through the cyclone (C) for dedusting. The remainder passes up the distillation shaft and mixes with the retort gas.

This mixture comes off at the top (D) at about 100°C. and, after detarring, combines with the dedusted producer gas, The mixture has a calorific value of 170-180 B.Th.U. per cu.ft., and a temperature of approximately 300°C. which is satisfactory for heating a carbonising plant.

When using coal of a calorific value of 12,500 B.Th.U. per lb., the producer fuel consumption is about 15% higher than with dry coke containing 10% ash, but on the other hand there is a credit for tar of about 12 gal. per ton of coal.

Labour costs are similar to other types of producer but initial capital cost is higher. The W.H. boiler steam output falls, but this is counterbalanced by the fact that the producer itself is self-steaming.

Considering the over-all economics of gas production, carbonisation costs depend primarily on the delivered price of the coal and the net value of the surplus coke and breeze. The cost of retort house labour, electric power, and water is virtually cancelled out by the value of the by-products such as tar, benzole, and surplus steam from waste heat boilers although, quite obviously, this will be governed by the prices ruling in different areas.

These days of continually changing prices of materials make it impossible to be dogmatic about the cheapest method of gas production, i.e., whether coal carbonisation, complete coal gasification or oil gasification, and also about the type of plant that will make the cheapest therm or the most economical calorific value. The following table provides a summary of the effects of different methods of retort working and the cost of gas production in each case.

Condition of operation	Steaming	P.G. dilution	40% Coal gas heating	100% Coal gas heating
500 B.Th.U. gas				
Therms per ton	78	—	61.5	36.75
Surplus coke and breeze per ton .. .. .. cwt.	10.55	—	11.75	13.55
Tar yield per ton .. gal.	14	—	14	14
475 B.Th.U. gas				
Therms per ton	84.7	79.3	66.8	40.0
Surplus coke and breeze per ton .. .. .. cwt.	10.0	10.4	11.30	13.25
Tar yield per ton .. gal.	15	14	15	15
450 B.Th.U. gas				
Therms per ton	93.6	81.0	73.6	44.1
Surplus coke and breeze per ton .. .. .. cwt.	9.2	10.25	10.65	12.8
Tar yield per ton .. gal.	16	14	16	16
With coal at £7 per ton and coke at £7 10s. per ton				
Cost per therm				
500 B.Th.U. gas .. pence	9.36	—	10.12	12.54
475 B.Th.U. gas .. pence	9.21	9.38	9.92	12.18
450 B.Th.U. gas .. pence	9.10	9.35	9.80	11.97
With coal at £7 per ton and coke at £8 per ton				
Cost per therm				
500 B.Th.U. gas .. pence	8.55	—	8.98	10.32
475 B.Th.U. gas .. pence	8.50	8.60	8.91	10.20
450 B.Th.U. gas .. pence	8.50	8.60	8.94	10.22

As a matter of academic interest this table gives the approximate cost per therm on the basis of:

$$\frac{\text{Cost of coal minus value of coke and breeze}}{\text{Therms per ton}}$$

under various conditions of operation and costs of coal and coke. The cost for any other combination of coal/coke price ratio can be worked out similarly. The table shows how necessary it is to consider each case on its merits. The cost of coal gas heating is improved as the value of coke increases. No credit is taken for tar. The yields are merely included to assist those interested in calculating their own individual costs.

Gordon Reports on Natural Gas in Canada

To encourage thought on long-term Canadian plans and prospects, to collect information about various sectors of the Dominion's economy and factors likely to influence their growth and development, and to point out some of the difficulties and problems that may need to be tackled if the best use is to be made of available resources, a Royal Commission, headed by Walter L. Gordon, has, for some time, been studying conditions in Canada and has recently published an interim report.

In its study of Canadian energy prospects, the Commission, which is known as the Gordon Commission, finds that one of the most striking things emerging is the expectation that by 1980 between two-thirds and three-quarters of a greatly increased total of energy generated will be supplied by petroleum or natural gas, in both of which commodities Canada will, on balance, be more than self-sufficient. The projection of demand for natural gas suggests, in fact, that its consumption may increase ten or more times within the next 25 years.

On supplies, the Commission says there is every reason to believe that the geology of the interior plains of Canada from the United States border to the Northwest Territories is favourable to the discovery of large quantities of both oil and gas and that prospective reserves should be more than sufficient to meet any foreseeable future demand in Canada.

Indeed, the Commission's study suggests a possible level of production in 1980 substantially above the forecast domestic demand, and the potential output of gas is estimated at over 15 times the 1955 level, or about 50% more than expected domestic requirements. This means that there will be large quantities of gas available for export.

The Commission's report goes on to say that, in view of Canada's location relative to world markets and to competing sources of supply of oil and gas, her exports would have to be directed to the U.S. market, and export demand will largely govern Canada's ability to reach the suggested possible level of output. Canadian average costs of exploration, development, and production are lower than those in the U.S.

Natural gas from Western Canada now finds its main market on the Prairies, although the completion of pipelines now under construction will open the new and large markets of Central Canada and British Columbia. In addition, some gas is now exported to the U.S. and much larger amounts will move when the pipeline for the Pacific Northwest is completed before the end of 1957.

The Commission considers that it is in Canada's interest to permit gas to be exported provided adequate reserves are maintained to serve the Dominion's own longer term future needs and assuming that reasonable provision is made for the sale of the by-products of the purifying and cleaning process.

In any negotiations concerning gas exports with the U.S. terms would have to be approved by the Federal Power Commission, but there is no similar body in Canada to protect Canadian interests, and the bargaining position of Canadian exporters would need strengthening if prices and other terms are to be established on a reasonable basis.

The Commission suggests that a national energy authority be established to be responsible for advising on long-term energy matters, including the further refining of oil and gas in Canada and the disposal of by-products and for approving all contracts or proposals respecting the export of oil or gas. It further recommends that the Canadian authorities consider these potential exports before entering into inter-governmental negotiations with the U.S. on power developments.

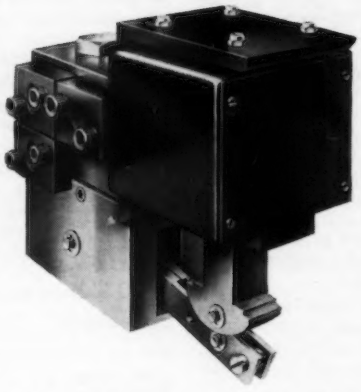
New Range of Ellison Hydraulic Valves in Production

GEORGE ELLISON, LTD., announce that a new range of Ellison hydraulic valves is now in production and will be on show for the first time at the British Plastics Exhibition in July.

Constructed to meet many different requirements in the control of hydraulic power, valves of this new range may be operated by hand, foot, solenoid, air cylinder, air diaphragm or hydraulic cylinder. The design allows easy conversion from one method of operation to another. No setting is required when reassembling a valve after maintenance and arrangements can be made for manifold mounting.

The new valves are suitable for standard pressures of up to 2 tons per sq. in. but for some services they can be used with pressures of up to 3 tons per sq. in.

Operating handles are interlocked to prevent wastage of pressure fluid by ensuring that exhaust and inlet ports are not open at the same time and the design permits safe interlocking with machine guards.—*George Ellison, Ltd., Perry Barr, Birmingham.*



One of the new range of Ellison hydraulic valves with the attachment for solenoid operation. The valve is easily convertible for operation also by hand, foot, air-cylinder, air-diaphragm or hydraulic cylinder.

TRADE NEWS SUPPLEMENT

New Heavy Duty Bristol 4-Tool Compressor

A NEW addition to the range of portable compressors by Bristol Pneumatic Tools, Ltd., is the Model ATS/270/PD.4, a four-tool plant incorporating a number of refinements.

Following the established Bristol Duplex design of double acting two-stage compression, this model has a free air delivery of 230 c.f.m. at a working pressure of 100 p.s.i.g. at 1,400 r.p.m. The compressor comprises a double bank of two cylinders each forming a 90° vee-twin unit and mounted on a common crankcase.

Cooling is by large-capacity intercooler and cooling fan. Output is fully automatic and total unloading is effected by the pilot unloader which maintains the supply of air between the minimum and maximum pressures, having a 15 p.s.i. differential.

The pilot unloader also operates an engine speed control, automatically reducing speed when the compressor is idling, while a 'time-lag control' re-establishes full engine r.p.m. before the compressor comes back on load.

A Dorman four-cylinder diesel engine of 1,595 c.c. developing 60 B.H.P. at 1,400 r.p.m. is fitted as standard, power being transmitted through an 11½-in. Rockford heavy-duty single plate segmental disc-type clutch incorporated in a power take-off housing which couples the engine and compressor as a single unit and ensures permanent alignment.—*Bristol Pneumatic Tools, Ltd., Fishponds, Bristol.*

New Pressurised Pyrene Fire Extinguisher

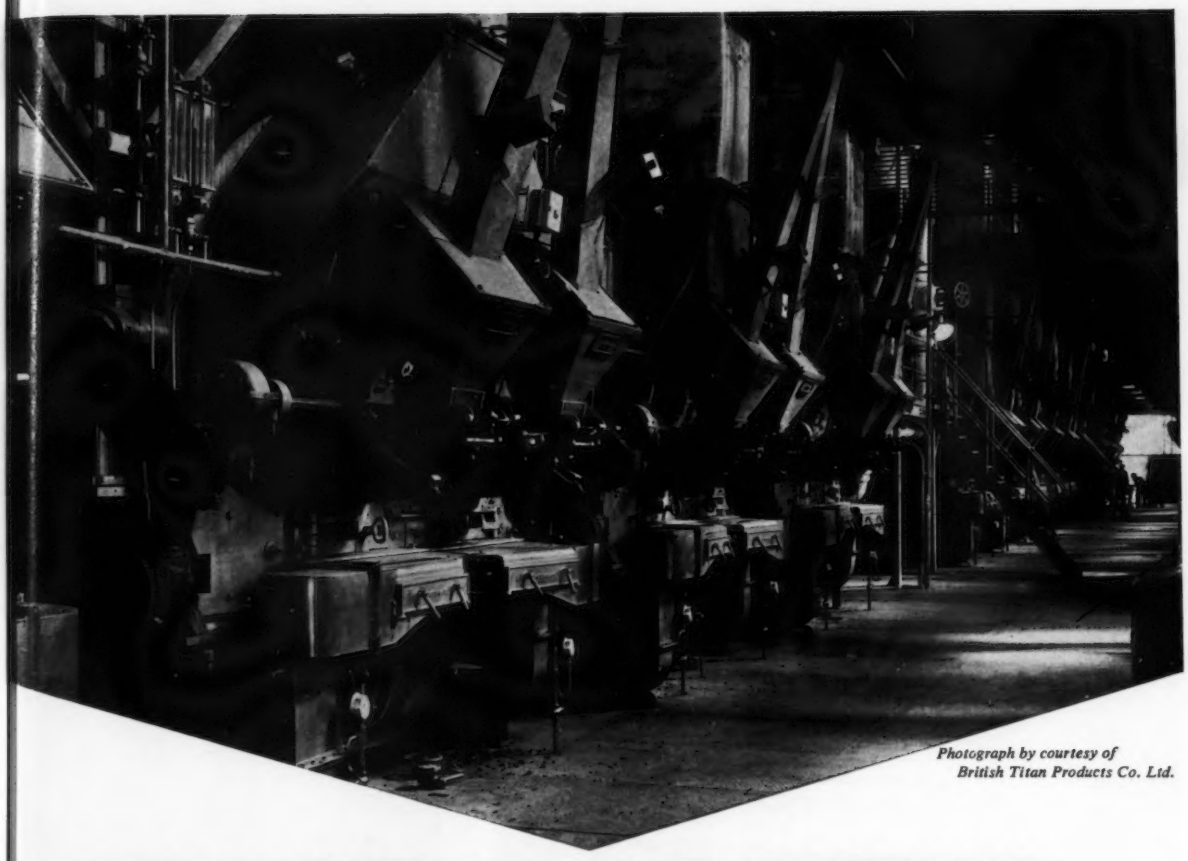
A NEW pressurised fire extinguisher of the vaporising liquid type has been developed by The Pyrene Co., Ltd. Its outstanding feature is a special squeeze-grip release valve that facilitates one hand operation, enables the extinguisher to be used to the maximum advantage, and provides perfect on-off control of the discharge of fire fighting liquid.

Other features of the new extinguisher are a special locking device which provides added security against accidental discharge and vibration, and a small pressure gauge which allows the pressure within the container to be checked instantly at any time. This gauge also simplifies the process of recharging.

The extinguisher is supplied charged with one quart of either 'Pyrene' fire extinguisher liquid or chlorobromomethane (CB). Both are special liquids which form a heavy, dry, cohering blanket of fire-smothering vapour immediately they reach a temperature of 200°F. or more. These liquids are non-damaging to materials or mechanism and do not readily deteriorate or freeze. Both are effective against all fire outbreaks involving motor vehicles, and small petrol, paraffin, or alcohol fires. They may also be used with safety against outbreaks involving electrical apparatus.—*The Pyrene Co. Ltd., 9, Grosvenor Gardens, London, S.W.1.*

'Plastex' Compression Joint Makes Polythene Tube Connections Easy

Compression Joints, Ltd., announce the introduction of the 'Plastex' joint, for use with normal gauge polythene tube to B.S.S.1972. The joint is an instantaneous mechanical type, consisting of the body of the fitting, the compression nut, and a patent cupped ferrule. As can be seen in the exploded pictures above, the ferrule incorporates a knurled inner copper liner, giving added friction to the internal wall of the tube. When the nut has been tightened, the ferrule makes a permanent union with the end of the tube enabling the assembly to be broken down and remade at will. The ferrule has been designed so that the amount of compression on to the tube is controlled, thus ensuring a perfect seal without damage to the tube. The 'Plastex' joint is suitable for permanent installations; laying below or above ground; agricultural services; sinks and waste work; temporary services; and emergency installations. It is available in a wide range of patterns from ¼ in. to 2 in.—Compression Joints, Ltd., Tyburn Road, Erdington, Birmingham, 24.



Photograph by courtesy of British Titan Products Co. Ltd.

THE PROOF OF THE PUDDING...

. . . For the large scale extensions to the Grimsby Plant of British Titan Products Co. Ltd., Messrs. Marshall's of Gainsborough ordered **4 sets of Crosthwaite Furnaces in July 1950** — all with Self-cleaning Grates, Fan Air, stand-by Steam Jets, Mechanical Stokers and Coal Handling Plant. **A further 5 sets were ordered in January 1954, 4 more in November 1954, followed by a further contract in November 1956.**

Crosthwaite Furnace Equipment gets the maximum heat from all solid fuels. Crosthwaite Equipment is renowned for its efficiency, reliability and long life. How much can Crosthwaite Equipment save you? Send for details now.

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32 Victoria Street, LONDON S.W.1
Telephone ABBey 2966

THE NEW WORLD Cadet

specially designed for

- ✻ **The bed sitting room**
- ✻ **The flat**
- ✻ **The maisonette**
- ✻ **The small household**

The **NEW WORLD** Cadet is intended primarily for 2 or 3 persons, but a whole meal for 4 can be cooked in the oven, and, when occasion arises, the Cadet will even cater for 6.

The width is only 19¼″ or 17½″ without gas match.

The Regulo controlled oven has a forward flue vent and a drop down door. The whole cooker has been designed for easy cleaning, and the oven has the new easy clean sides, and removable burner and burner box.

Available with or without platerack.

sell

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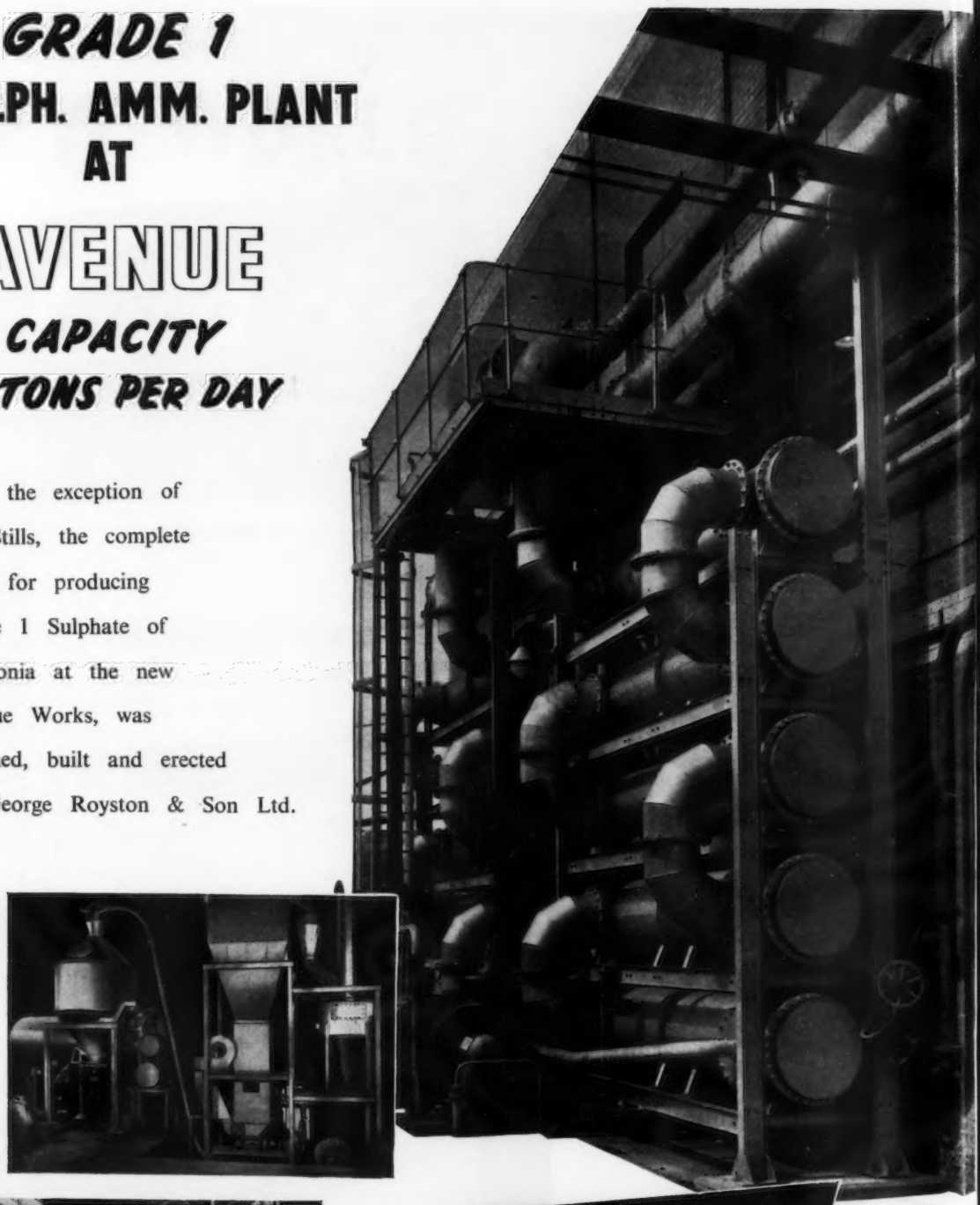
PRODUCT OF Radiation Ltd.

RADIATION GROUP SALES LTD., 7 STRATFORD PLACE, LONDON, W.1

GRADE 1
SULPH. AMM. PLANT AT
AVENUE
CAPACITY
35 TONS PER DAY

With the exception of the Stills, the complete plant for producing Grade 1 Sulphate of Ammonia at the new Avenue Works, was designed, built and erected by George Royston & Son Ltd.



Roystons

GEORGE ROYSTON & SON LIMITED, POCMOOR WORKS, BARNSLEY
CHEMICAL ENGINEERS & LEADBURNERS
Telephone: BARNSLEY 5215/6 Telegrams: "SATURATOR"

A New Approach to Mechanical Handling—Power Handle

THE Power Handle—the swing loader with the 180° slew—saves time, wear and tear, and money, claim the makers, Power Handling, Ltd. Specially designed and manufactured in Britain to meet the need for a mobile loading shovel capable of handling *all* types of material, the Power Handle works with speed and efficiency, *even in confined spaces.*

A unique feature is the swing turntable which enables the jib to slew through *a total arc of* 180°. Lifting is accomplished by two powerful hydraulic rams and the robust excavator-type turntable is actuated by hydraulic cylinders built into the main frame, thrust loads being catered for by heavy-duty, adjustable hook rollers. Independent bucket crowd and tipping action is provided by a fifth hydraulic ram.

Heavy shock loads are inevitable when operating this type of equipment and the Power Handle has been specially designed to counteract them. Counter-balance weights make possible efficient lifting and swing motions even when working on uneven ground.

The 180°-arc makes it possible to load material into road or rail vehicles quickly in the most confined space. The hydraulic bucket tip provides positive control to discharge at any height.

Alternative equipment includes a 1-ton capacity fork lift, and a crane hook and grab.

The hydraulic equipment includes finest quality gear pump and control valves with load holding and inching characteristics and double acting hydraulic rams with hard industrial chrome-plated connecting rods.—*Power Handling, Ltd., Castlefield Works, Bingley, Yorks*

The new small S.1 type mobile industrial loading shovel by F. E. Weatherill, Limited, of Welwyn Garden City, is only 4 ft. 6 in. wide with a wheel base of 4 ft. 9 in. It is highly manœuvrable and has exceptionally good forward reach, together with a discharge height that is more than adequate to load tippers and other trucks of usual type. It has a half-ton lifting capacity.

NEW ADDITION TO 'MEGGER' RANGE

A RECENT addition to the well-known 'Megger' range of instruments manufactured by Evershed & Vignoles, Ltd., is the 3-voltage insulation tester Series 2.

This new instrument offers distinct advantages in applications where different test voltages are required, all voltages being derived from a single instrument. It is available in two patterns, one having testing pressures of 1,000, 500, and 250 volts with an insulation range of 0-200 megohms, the second with pressures of 500, 250, and 100 volts, with an insulation range of 0-100 megohms. Both incorporate a switch for the selection of the required pressure.

A special feature of this instrument is that the scale range remains the same for each of the three testing pressures selected.—*Evershed and Vignoles, Ltd., Acton Lane Works, Chiswick, London, W.4.*

New Sight Feed Indicator

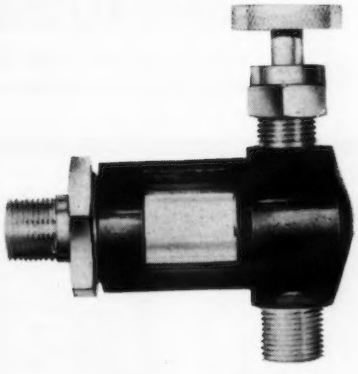
Adjustable Flow Type

THE new model L.M.15 sight feed indicator is said to provide flexibility of liquid flow and to permit control of the amount of oil or other liquid being used, and is ideal for paper mill oiling systems, steam and gas engines, sugar mill machinery and a variety of other equipment.

Being of the double-window type, with drilled outlet nozzle, the size of the liquid stream can be observed from either side. Extremely fine control of the amount discharged is made possible by the port hole type of regulator and the very fine thread of the needle valve.

It is designed for rigid pipe or flexible hose connection on inlet and with a range of outlet adaptors to suit individual requirements. The indicator is vented to prevent fogging.

With an all gun-metal body and toughened sight glass, the body is finished crinkle black with chromium-plated adaptors and adjusting screws, the height of the body is 2½ in. and diameter of the body cylinder is 1¼ in. Although the standard size is ⅜ in. B.S.P., inlet and outlet, other sizes are available.—*Liquid Systems Limited, Union Road, Croydon, Surrey.*



Muir-Hill Loader: New Bucket Range, Improved Control

CHANGES in the design of the Muir-Hill 2-WL hydraulic loader affecting the standard bucket range and the bucket control linkage have been made by E. Boydell & Co., Ltd.

This model is now available with six different buckets ranging from the standard 1 cu. yd. 4 ft. 6 in. wide bucket to an over-size 3 cu. yd. nominal capacity full width bucket for coke loading, and including ¾ cu. yd. quarry-type buckets, and a 1½ cu. yd. full width light materials bucket.

All these buckets are based on the curved back design claimed greatly to enhance the load-getting ability of the machines, to reduce wear, and to permit a heaped load in a level bucket to be carried at any beam height with improved driver visibility and machine stability.

The redesigned linkage incorporates oil-less bushes and provides ample driver controlled and/or automatic roll back action. The tipping angle is also increased, positive bucket stops being provided at all tipping heights over 6 ft. 9 in. to tipped bucket lip to ensure positive discharge.

The solid beam to frame and bucket to beam linkage is, however, still in production and available for those jobs for which it is most suitable.—*E. Boydell & Co., Ltd., Old Trafford, Manchester, 16.*

★ *Specialists in the repair of*
REINFORCED CONCRETE STRUCTURES
ETC., also
LININGS FOR STEEL BUNKERS

GUNITE
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TELEPHONE HITCHIN 4371

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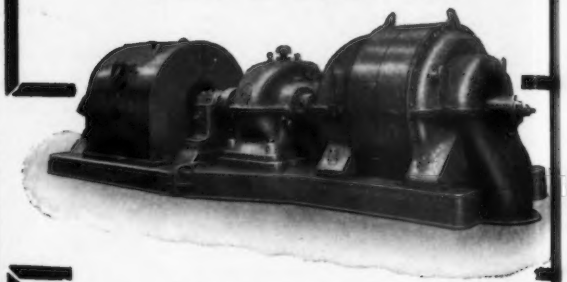
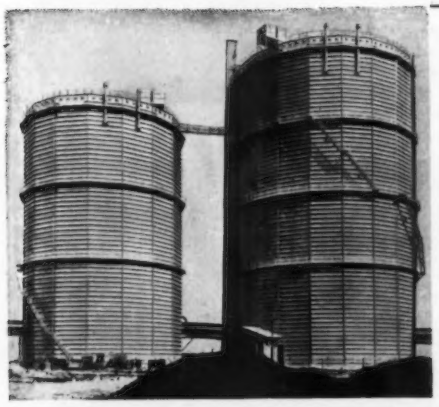
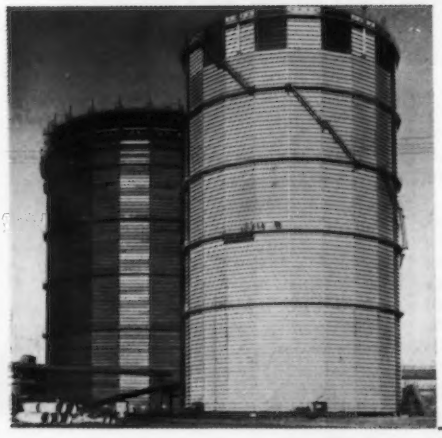
We build a complete range of Compressors & Exhausters for air and GAS, suitable for all purposes connected with the GAS industry, including Turbo-Compressors for large capacities, as illustrated below



WRITE FOR PAMPHLET No. 1018 GIVING PARTICULARS—
REAVELL & CO., LTD.,
RANELAGH WORKS, IPSWICH.
Telegrams: REAVELL, IPSWICH Telephone: 2124 & 5.





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STOP COCK BOXES
TOOLS, ETC.

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/6d.; by post 1/8d.

Subscription Rates:—65/- per annum; (Payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10 in. deep × 7 in. wide: block screen 120.

BUSINESS MANAGER: S. T. CULLEN

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN & MIDLANDS REPRESENTATIVE: A. Engelhardt, T.D., 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: FLEet Street 2236-7. *Telegrams:* Gasking, Fleet, London.

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SPECIALLY ACTIVATED OXIDE OF IRON

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Highest prices paid for Spent Oxide.

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Telegrams: Purification, Stock, London" Telephone: London Wall 7938/9 & 7930

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FOR SALE.—Unused Walworth Lubricated Valves at ordinary Gland Cock prices. 2 in. and 3 in. screwed, 3 in. and 4 in. flanged. Cleckheaton Engineering Co. Ltd., Cleckheaton, Yorks. Phone 397.

SPECIAL OFFER: Large quantity of new cast iron fullway valves, all iron parts, 8 in., 10 in., 12 in. and 14 in. for sale. The Midland Iron & Hardware Co. (Cradley Heath) Ltd., Cradley Heath, Staffs. Tel.: Cradley Heath 6264 and 5.

APPOINTMENTS VACANT

ENGINEER familiar with the gas and/or coke-oven industry and works practice, who can write clear and concise English, required as assistant to the editor of a monthly technical journal. No. 323, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

SCOTTISH GAS BOARD

EDINBURGH AND SOUTH-EASTERN DIVISION
GALASHIELS WORKS SUPERINTENDENT

APPLICATIONS are invited from suitably qualified persons for the above position.

The salary will be within A.P.T. grade 8 (£745-£825 per annum) and the person appointed will be responsible to the Production Engineer (Borders) for the supervision and control of Galashiels Works.

Applicants should have experience of continuous vertical retorts and normal ancillary plant. If required, accommodation adjacent to the works is available at a reasonable rent and on a service tenancy agreement. The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, and giving details of education, training, qualifications and experience should be sent to the undersigned within 14 days of the appearance of this notice.

DAVID BEAVIS,
General Manager.

15, Calton Hill,
Edinburgh, 1.
May 27, 1957.

SCOTTISH GAS BOARD

GLASGOW AND WESTERN DIVISION
HOME SERVICE ADVISERS

APPLICATIONS are invited from HOME SERVICE ADVISERS to be employed in the Glasgow District of the Scottish Gas Board.

Candidates should hold a recognised Domestic Science Certificate and be capable of conducting Demonstrations and Lectures.

The salary will be within Special Scale IV (£382-£520 per annum). The post is pensionable and the successful candidates will require to pass a medical examination.

Applications, stating age and giving particulars of education, training, experience and qualifications, should be addressed to the undersigned not later than Saturday, June 15, 1957.

H. R. HART,
General Manager.

9, George Square,
Glasgow, C.2.

ROYAL TECHNICAL COLLEGE, SALFORD

ACTING PRINCIPAL J. F. YATES, B.Sc.(Lon.), M.Sc. (Belfast), M.I.E.E.

APPLICATIONS are invited for the post of SENIOR LECTURER in GAS ENGINEERING from suitably qualified candidates who should be Corporate Members of the Institution of Gas Engineers and/or should possess a University Degree or other equivalent qualification. Teaching experience is desirable and industrial experience is essential.

Applicants should be capable of teaching Gas Engineering with special reference to Distribution.

Salary in accordance with the Burnham Technical Scale, 1956, for Senior Lecturers, viz., £1,350-£1,550.

For further particulars and form of application, please send a stamped addressed envelope to the Principal, Royal Technical College, Salford 5.

Applications should be returned as soon as possible.

R. RIBBLESDALE THORNTON,
Clerk to the Governors.

WEST MIDLANDS GAS BOARD

INDUSTRIAL DEPARTMENT
TECHNICAL ASSISTANT—DEVELOPMENT SECTION

A VACANCY for a TECHNICAL ASSISTANT has occurred in the Development Section, on the Industrial Gas Officer's staff, located in Birmingham.

Duties will include development work on experimental and prototype plant and tests on gas heated plant and apparatus and on process materials.

Candidates should have a comprehensive knowledge of fuel utilisation and possess qualifications in Gas Engineering, Mechanical Engineering or Fuel Technology.

The salary for the post will be within A.P.T. Grade 7 (£705-£785 p.a.) of the National Salary Scales.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham 15, to reach him not later than June 17, 1957.

K. W. NEVETT,
Industrial Relations Officer.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
TECHNICAL ASSISTANT—HINCKLEY DISTRICT

APPLICATIONS are invited for the above pos from candidates experienced in the normal d of a Gas Works Technical Assistant inclu Chemical and Production Plant control. Appli should have received training and experience in branches of modern Gas Works practice.

Candidates should hold or be studying for a re nised professional qualification in the Industry.

Salary will be within A.P.T. Grade 4 (£465 p.a.) of the National Salary Scales.

The post is pensionable and the successful ca date may be required to pass a medical examinat

Applications stating age, details of training, qu fications and experience, together with the na of two referees, should be addressed to Mr. A. Al Divisional General Manager, West Midlands G Board, Gas Street, Coventry, to reach him not l than June 17, 1957.

K. W. NEVETT,
Industrial Relations Office

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
TECHNICAL ASSISTANT, COVENTRY DISTRICT
FOLESHILL WORKS

APPLICATIONS are invited for the above appo ment from candidates conversant with gasw routine tests and preferably having experience continuous vertical retorts and carburetted water plants.

Applicants should have qualified in Part I of Associate Membership of the Institution of Engineers or should possess an equivalent qua cation.

The salary for the post will be in accorda with A.P.T. Grade 5 of the National Salary Sc (£605-£685 p.a.).

The post is pensionable and the successful ca date may be required to pass a medical examinat

Applications, stating age, education and experi should be addressed to Mr. A. Allen, Divisi General Manager, West Midlands Gas Board, Street, Coventry, to reach him not later than J 17, 1957.

K. W. NEVETT,
Industrial Relations Office

EAST MIDLANDS GAS BOARD

NOTTS. & DERBY DIVISION
SHOWROOM SUPERVISOR—DERBY

APPLICATIONS are invited for the position SHOWROOM SUPERVISOR at the Friar G Showrooms, Derby.

Applicants must have had considerable experie of Showroom supervision, appliance sales, consu service and window and general display pract Possession of the certificate in Gas Salesmanship Consumer Service or an equivalent qualification wo be an advantage.

The salary payable will be within Grade A.P.T (£705/£785).

The post is pensionable and the successful ap cant will be required to pass a medical examinat

Applications giving full details of age, educati qualifications and experience, together with the na of two referees should be addressed to reach undersigned not later than June 22, 1957.

K. L. PEARCE,
Divisional General Manager

East Midlands Gas Board,
Notts. & Derby Division,
P.O. Box No. 62,
Friar Gate,
Derby.

EDUCATIONAL

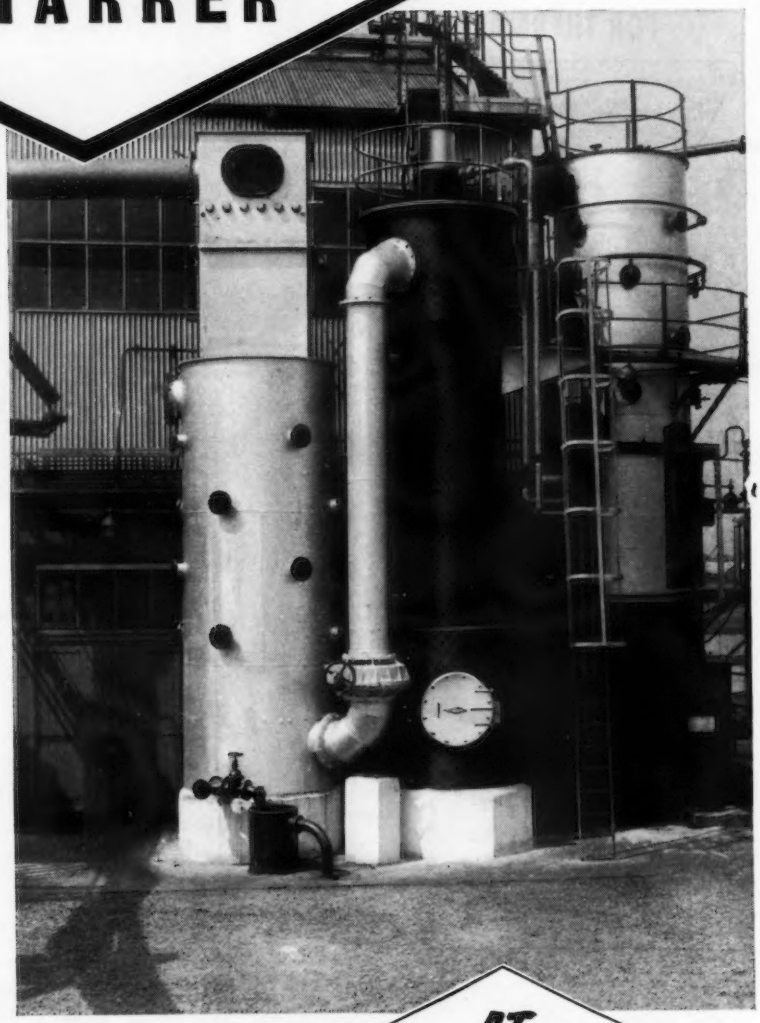
THE UNIVERSITY OF MANCHESTER

GAS PLANT MANUFACTURERS' DEVELO MENT COUNCIL SCHOLARSHIP

APPLICATIONS are invited for the above Schol ship, tenable for 3 years from October, 19 The Value of the Scholarship is £350 per annum (l fees), and is not subject to deduction on account parental income. Candidates must be of Brit nationality and will be required to read for Degree of B.Sc. or B.Sc. Tech. with Honours Chemical or Civil or Mechanical Engineering. Cth things being equal, preference will be given to ca dates already employed in the Gas Plant Indust Candidates must be nominated by their Headmas (and, if they are in employment, by their emplo also), and selected candidates will be required attend at the University for interview. The Sch ship Regulations and Forms of Nomination ma obtained from the Registrar, the University, Ma chester 13, to whom the forms should be retur not later than July 1, 1957.

C8467

HOLMES-ELEX
ONIA-GEGI
DETARRER



This Detarrer, installed to the order of Messrs. Humphreys & Glasgow Ltd., was commissioned in 1954. It represents the first application of electrical precipitation to the Onia-Gegi cyclic gas making process in the U.K.

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Driving and Conveyor Chains of the best quality; made of Ley's Celebrated Blackheart Malleable Iron.
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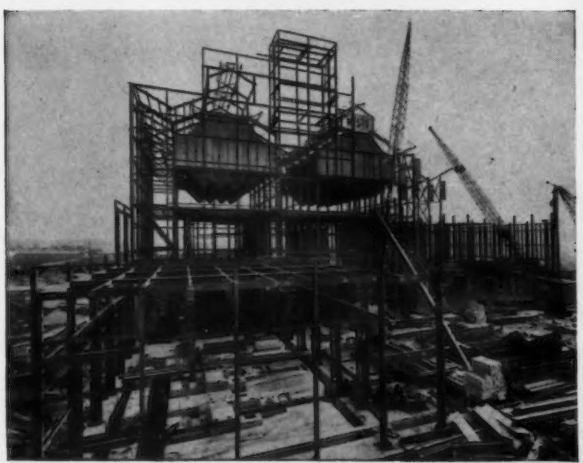

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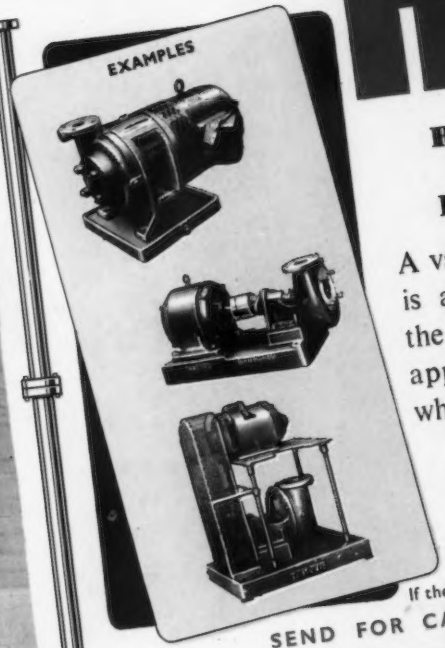

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